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MARCH 1945

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part 3



CONTENTS

	PAGE
The Secretary's Page	57
Wisley in March	58
Garden Work	60
The Making of Lanarth. By the Bishop of Truro. <i>Illustrated</i>	63
Who was Who? By A. Simmonds. <i>Illustrated</i> .	73
Lilium Cathayanum. By H. F. Comber . . .	78
The Duke's Tea Tree. By E. Cahen . . .	79
Dwarf and Bush Tomatoes. By F. C. Brown. <i>Illustrated</i>	81
The Carrot Fly and its Control in Gardens. By G. Fox Wilson. <i>Illustrated</i>	84
Narcissi at Wisley, 1942-44	89

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AUGUST 1945

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part 8

CONTENTS

	PAGE
The Secretary's Page	217
Wisley in August	220
Garden Work	222
New Types of Hybrid Rhododendrons for the Small Garden. By J. P. C. Russell	225
A Giant Stock. By The Hon. Lewis Palmer. <i>Illustrated</i>	234
Some Rare Rock Plants. By Dr. P. L. Giuseppe. <i>Illustrated</i>	235
Four Friends of a Hundred Years. By the Bishop of Truro. <i>Illustrated</i>	238
Rimaria Heathii. <i>Illustrated</i>	239
The Origin of the Name "Green Gage." By A. Simmonds	240
Lily Notes from New England. By W. N. Craig	241
Dahlias—A Correction	243
The Award of Garden Merit.—LXXIV	244
Plant Awards in 1945	245
Book Notes	248
Proceedings	xxxvii

54531

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Vol. LXX



Part 10

CONTENTS

	PAGE
The Secretary's Page	277
Wisley in October	279
Garden Work	281
Difficult Plants for the Enterprising Amateur. By D. Wilkie. <i>Illustrated</i>	284
<i>Embothrium coccineum</i> . By W. Fox	289
Lilies. By R. W. Wallace	291
Florists' Flowers.—Chrysanthemums. By J. Woolman. <i>Illustrated</i>	296
On the Flora of Greece. By M. Ogilvie-Grant	298
Awards to Plants in 1945	305
Book Notes	308
Proceedings	xlix

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F.R.H.S., writing in "Poultry" suggests that all fruit trees not bearing fruit this year (there are a great many) should be vigorously sprayed with an up-to-date wash every month, down to December, to kill insects, and promote vigorous growth for 1946.

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Vol. LXX



Part 12

CONTENTS

	PAGE
The Secretary's Page	341
Wisley in December	343
Garden Work	345
Florists' Flowers—The Iris. By G. Anley. <i>Illustrated</i>	348
Bi-centenary of William Curtis. By the Bishop of Truro	353
The Cultivation of Rhododendrons. By F. Hanger. <i>Illustrated</i>	355
An Additional Note on Albino Flowers. By Eleenora Armitage	362
The Award of Garden Merit—LXXVI	363
Further Note on Embothrium Coccineum. By Wilfrid Fox	364
Cotyledon oppositifolium	364
Awards to Plants in 1945	365
Book Notes	368
Proceedings	lvii
Index	lxi

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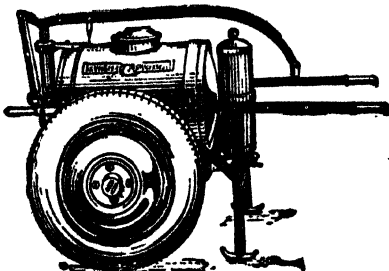
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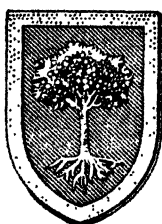
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THE WAY OF TO DAY
— FOR THE CROPS OF TO MORROW

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part I

January 1945

THE SECRETARY'S PAGE.

Subscriptions, 1945.—Fellows are reminded that their subscriptions to the Society fall due on January 1, and to participate in the distribution of seeds payment for 1945 is necessary. If subscriptions are paid quickly and all changes of both private and bankers' addresses are notified, the work of the short-handed staff will be considerably lightened.

The Society's Tickets.—It is regretted that on some of the tickets it will be found that the first Meeting on February 20 is described as opening at "11 noon" instead of "12 noon."

Seed Distribution.—There are two enclosures, in reference to the distribution of seeds, circulated with this JOURNAL—an application form and a list of the seeds available. The seed harvest this year has not been so good owing to weather conditions, and therefore all Fellows who desire to make application for seeds should do so as quickly as possible and not forget to give alternative suggestions, space for which is provided on the application form.

Programme for 1945.—On Tuesday, February 20, 1945, at 3 P.M., on the Society's premises, the President will present the Annual Report, Accounts and the Awards. The Calendar of Meetings with Shows, circumstances permitting, is as follows :—

February 20 .	12 noon-5 P.M.	June 19 .	12 noon-5 P.M.
March 20 .	12 noon-5 P.M.	July 3 .	12 noon-5 P.M.
{ April 17 .	12.30 P.M.-5 P.M.	July 24 .	12 noon-5 P.M.
April 18 .	10 A.M.-5 P.M.	Sept. 11 .	12 noon-5 P.M.
May 1 .	12 noon-5 P.M.	{ Oct. 2 .	12.30 P.M.-5 P.M.
May 15 .	12 noon-5 P.M.	Oct. 3 .	10 A.M.-5 P.M.
{ May 29 .	12 noon-5 P.M.	Oct. 16 .	12 noon-5 P.M.
May 30 .	10 A.M.-5 P.M.		
{ May 31 .	10 A.M.-5 P.M.		

The following competitions will be held :—

- March 20 . Competitive Classes for Daffodils.
 April 17, 18 . Daffodil Show. Competitive Classes for Sewell Medals for Alpines.
 May 15 . . Competitive Classes for Flowering Trees and Shrubs. Competitive Classes for Sewell Medals for Alpines.
 June 19 . . Competitive Classes for Flowering Shrubs.
 July 3 . . Competitive Classes for Lilies and Competitive Classes for Fruit.
 July 24 . . Competitive Classes for Fruit and Vegetables and for Border Flowers.
 Clay Cup Competition for Scented Roses and for Flower Arrangement.
 September 11 . Competitive Class for Cacti and Succulents.
 October 2, 3 . Fruit and Vegetable Show.
 October 16 . Competitive Classes for Berried Shrubs and Autumn Foliage.

Any changes in this programme will be announced in the monthly JOURNAL on the Secretary's Page.

Demonstrations at Wisley.—The following demonstrations will take place at Wisley during 1945 :—

Vegetable Garden.

- March 7, 8 . Out-door Seed Bed and Seed Sowing 2-4 P.M.
 May 2, 3 . Control of Vegetable Pests and Diseases 2-4 P.M.
 May 16, 17 . Thinning, Transplanting and Successional Cropping 2-4 P.M.
 Sept. 19, 20 . Harvesting and Storing 2-4 P.M.
 Oct. 10, 11 . Digging, Trenching, Manuring and Composting 2-4 P.M.

Fruit Garden.

- March 28, 29 . Spring Spraying of Fruit Trees 2-4 P.M.
 July 11, 12 . Summer Pruning of Fruit Trees 2-4 P.M.
 Nov. 7, 8 . Planting of Fruit Trees and Roses 2-4 P.M.
 Dec. 5, 6 . Pruning of Fruit Trees 11 A.M.-1 P.M.

Flower Garden.

- March 14, 15 . Rose Pruning and Pruning of Shrubs 2-4 P.M.
 March 21, 22 . Seed Sowing and Vegetative Propagation of Alpines 2-4 P.M.
 June 6, 7 . Summer Pruning of Shrubs 2-4 P.M.
 August 8, 9 . Vegetative Propagation of Shrubs 2-4 P.M.

In case of bad weather, a talk with lantern slides will be substituted. Fellows and their friends are asked to notify the Director, R.H.S. Gardens, Wisley, nr. Ripley, Surrey, of their intention to attend.

How to get to Wisley.—Fellows and Associates desiring to travel from London to Wisley should take a train from Waterloo to Esher and there pick up the 'bus No. 215, which will stop on request at the turning for the Gardens on the Portsmouth Road. For the times of the 'bus No. 215, inquiries should be made at the London Passenger Transport Board, 55 Broadway, London, S.W. 1 (Tel. : Abbey 1234),

and for particulars of the trains, the current time-table should be consulted or inquiries made at Waterloo Station (Tel. : Waterloo 5100).

Examinations.—The closing date for the Society's General Examination is Monday, January 8. The closing date for the National Diploma in Horticulture is February 1, 1945.

WISLEY IN JANUARY.

IN comparatively mild weather such as we have enjoyed during the last two winters a good deal of pleasure can be derived from a visit to the Gardens during January. Few plants are in flower in the open so early in the season, but there is a variety of colouring in the many evergreen trees and shrubs, and there are some deciduous species with attractively hued stems whose beauty becomes apparent only after the leaves have fallen. In addition, many plants are at their best in the Temperate and Half-hardy houses, and towards the end of the month the Alpine house will contain an even greater variety.

Of the plants flowering in the open the most conspicuous is the Chinese Witch Hazel, *Hamamelis mollis*. The best specimen, covered with fragrant, golden blossoms, is to be found in the Award of Garden Merit collection, but there are others in Seven Acres and also in the Wild Garden, where shady conditions have induced taller and less compact growth. The lighter *H. japonica* and its varieties *arborea* and *Zuccariniana*, coming into flower a little later, are most valuable, but none attains the high standard set by the Chinese species. *Mahonia japonica*, given a sheltered, woodland home as at Wisley, is outstanding both in its imposing evergreen foliage and in the foot-long, spreading racemes of scented, primrose-yellow flowers opening in succession for many weeks and often succeeded by bloomy purple berries. The frail flowers of Winter Sweet, *Chimonanthus fragrans*, are very liable to injury by frost, but in mild spells they open freely and their agreeable spicy scent makes up for rather dingy colouring. In the variety *luteus*, of which there is a plant growing against the west wall of the Laboratory, the flowers are of a brighter yellow without the purple markings of the type.

The Heath garden is gradually becoming colourful once again, the hybrid *Erica darleyensis* and the earlier varieties of *E. carnea* forming bright patches here and there among the grey-green of the Heathers and groups of the Cornish Heath still bearing faced, rust-coloured spikes. *E. lusitanica*, a tall, graceful plant with bright green foliage and white flowers, affords a pleasant contrast in habit and colour; but coming from Spain and Portugal it dislikes cold winters.

Other flowers to be seen outside include *Lonicera fragrantissima*, a half-evergreen bush Honeysuckle, extremely sweet but not making much show, *Viburnum fragrans*, Christmas Roses and the Algerian *Iris unguicularis*. Of the last named several varieties grow near the south end of the Laboratory. The common lavender one flowers most freely here, although the white form is often the first to open. There are also some of the narrow-leaved forms with deep violet, golden-veined blossoms, coming rather later.

Among the very first New Year flowers to open in the shelter of the Alpine house are the small Cyclamens, such as *C. coum*, *C. cilicicum* and *C. ibericum* in shades of rose, and *C. ibericum album* in white

warmed by the faintest hint of colour. Some bulbous plants are making an appearance, and of these we may note the Spanish *Narcissus asturiensis*, a tiny, frilly-crowned golden Daffodil, well proportioned although only three or four inches high; *Scilla Tubergeniana* with lilac blossoms opening almost at soil-level on rapidly-elongating scapes; and two early Snowdrops, *Galanthus Elwesii* and *G. latifolius*. The rate of increase in the number of flowers in this house is dependent upon the weather. During cold spells scarcely any change may be noticeable from one week to another, whereas a few warm days will bring out the bulbous Irises and cover with white, pink or yellow blossom the grey-green hummocks of the *Burseriana* Saxifrages and others whose buds have been visible for some weeks. The South African *Aster Pappi* is already carrying cheerful sky-blue and yellow flowers. *Ranunculus calandrinoides* achieves a pleasing colour scheme with glaucous leaves and large, pearl-white flowers flushed with pink and centred with gold. Some shrubs of value at this season as pot-plants are *Rhododendron moupinense*, whose fine white or rose-tinted blossoms rarely escape damage in the open, *Rosmarinus officinalis* var. *prostratus*, freely producing pale blue flowers on trailing growths, the deep blue *Lithospermum rosmarinifolium*, *Ribes laurifolium*, more or less evergreen, with racemes of greenish-yellow blossoms, and *Iberis semperflorens*, a white, Mediterranean Candytuft which never fails to flower during the shortest days of the year.

The Temperate house has a variety of choice shrubs in flower now. Camellias are represented by the lovely rose-coloured *C. saluenensis* and by a collection of varieties of *C. japonica*. Of these *magnoliaeflora* is most distinct in the form of its delicate pink flowers, 'White Swan' is an exquisite single and *myrtifolia alba* an old-fashioned, flattish double white of remarkable symmetry. There are also some young specimens of the free-flowering hybrids between *C. japonica* and *C. saluenensis*; of these 'J. C. Williams' is the most notable. Acacias too are prominent. The Mimosa, *A. dealbata*, reaches to the very top of the glass, carrying masses of fluffy, scented blossoms. *A. Baileyana*, remarkable for the silvery-blue colour of its finely cut leaves, is equally beautiful, and *A. adunca* is a pretty plant with narrow phyllodes and rich yellow flowers. Some other showy plants are *Buddleia madagascarensis*, trained on the west side of the house and producing a long succession of orange-flowered sprays, *B. asiatica*, with slender, drooping panicles of very fragrant white blossoms, and *Loropetalum chinense*, which has fine, interlacing branchlets set with innumerable creamy-white, Hamamelis-like flowers. Two species of Hibbertia, *H. dentata* and *H. volubilis*, climb near the glass on the east side, producing large, yellow flowers over a long period, and the wiry stems of the Epacris species are densely hung with red, pink or white bells among neat, Heath-like leaves. Some of the less conspicuous things flowering now are *Doryphora Sassafras*, an aromatic Australian shrub, *Correa speciosa* var. *Harrisii*, a neat bush with many tubular red flowers, *Gordonia chrysandra*, resembling a small-flowered Camellia, and *Grevillea alpina*, a dense shrub with grey, persistent leaves and clusters of small, rosy blooms.

GARDEN WORK.

THE quantity of vegetables produced in private gardens and allotments during the war has been a very valuable contribution to the nation's food supply, and it is only natural that a number of people should be hoping that they will soon be able to turn their temporary vegetable plots back into flower beds. There is even a danger that the importance of continuing to keep up a home-grown supply may not be fully realized, but it will be some time yet before greengrocers' shops will wear their pre-war aspect again. Owing to the improved conditions, however, it has been decided to include in the Reminders for the Month a section dealing with the flower garden, including those flowers which it is possible to grow under glass without the aid of artificial heat. It need hardly be emphasized that only limited quantities of flowers should be grown for the time being.

REMINDERS FOR JANUARY.

The Vegetable Garden.—Review the past season's cropping results and try to account for any failures which have occurred with a view to obtaining better returns during the coming year.

To obtain the best results from the vegetable garden it is essential to have a proper system of rotational cropping. Group together long-standing crops which will be in the ground next winter, *e.g.* Brussels Sprouts, Broccoli, Savoys, Kales and Spring Cabbages, etc.; this facilitates the work of ground preparation for the following season's crops.

Order seeds from a reliable source without delay, giving preference to proved varieties, making only a limited choice of new ones for the purpose of conducting a small trial.

Arrange in shallow boxes, eye-end upwards, good "seed" of a first early Potato and place in a cool, light, frost-proof structure.

When soil conditions are favourable push on with the digging of land as it becomes vacant. Endeavour each year, if possible, to bastard-trench one-third of the garden, adding farmyard manure or garden compost to this portion.

When lime is required it should be applied to the surface of the ground after digging is completed; hydrated lime being the form most easily obtainable.

Jerusalem Artichokes can now be planted in drills about 5 inches deep, 30 inches apart, allowing 15 inches between the tubers.

Roots in store should be frequently examined as the infection from a decayed specimen spreads quickly.

The Fruit Garden.—If not already prepared, ground on which it is intended to plant Strawberries during the coming spring should be deeply dug without delay, adding at the same time a good dressing of farmyard manure.

Where the planting of new fruit trees has not been completed every opportunity, when the soil is in a favourable condition, should be seized to complete the operation; if staking is necessary this should be done at the time of planting. A mulch of light material such as straw or bracken is advisable when planting at this time of the year.

During periods of favourable weather try to complete the pruning and training of fruit trees on walls, also all other hardy fruit trees

and bushes should be pruned except Gooseberries and Red Currants in those districts where birds are known to be troublesome in removing the buds from these bushes ; the pruning of these bush fruits should be delayed until March.

Examine greasebands to ascertain if they are clear of obstructions ; where necessary renew the grease.

Where tar-oil spraying has not already been carried out on fruit trees and bushes which start into growth early, such as Apricots, Cherries, Currants, Damsons, Gooseberries, Peaches, Nectarines and Plums, this should be completed at the first favourable opportunity. In a normal season follow with Pears and towards the end of the month with Apples. If a dinitro-ortho-cresol (D.N.C.) wash is preferred the spraying can be delayed until February and, in the case of Apples, March.

Fruit in store should be examined at frequent intervals in order to remove any specimens which show the least signs of decay ; these slightly damaged fruits can be used for immediate requirements thereby reducing the loss due to storage rots.

The Flower Garden.—For preference the site for growing Sweet Peas should be dug in the autumn ; if the ground has not already been prepared this should be done without delay.

Order flower seeds and, in view of a likely shortage of these seeds, resolve to use the minimum quantity ; in these times preference could be given to those seeds which can be sown directly into their flowering positions.

If not already done, complete the planting of Roses, deciduous trees and shrubs when soil conditions permit.

Remove bulbs growing in pots or bowls from the plunging material or dark cupboard to a cold frame or room when about 1 inch of new growth is apparent ; gradually accustom the plants to full light and a little more warmth as growth develops.

Prune and train ornamental Vines on walls and pergolas, also other climbers requiring similar treatment at this time of the year. (Information on this subject can be found in the leaflet entitled "Pruning of Hardy Shrubs," obtainable from the Royal Horticultural Society, Vincent Square, Westminster, S.W. 1.)

When attending to shrubberies remove any suckers which have been overlooked from grafted shrubs such as Lilacs, Rhododendrons and *Viburnum Carlesii*.

A periodical examination of Dahlia tubers in store is advisable and, where necessary, supplementary protective material should be applied during periods of severe frost.

Unheated Greenhouses and Frames.—Thoroughly cleanse the inside of greenhouses and frames as the opportunity occurs ; wash all wood-work with a disinfectant and limewash the walls ; periodical washing of the outside glass ensures the maximum amount of light.

Place compost in frames or greenhouses in which it is intended to grow vegetables during the coming season. Make a sowing of Carrots, Radishes and Spinach towards the end of the month to mature in the frames, also early Peas and Broad Beans in boxes for planting in the garden about the end of March.

Ventilate freely frames in which Cauliflowers, Lettuces and Violets, etc., are overwintering, but exclude rain and severe frost, endeavouring to keep these plants as hardy as possible. Periodically remove decaying foliage and lightly stir the soil between the plants. Excessive

dampness is the greatest enemy of plants growing in frames at this time of the year. Water sparingly plants growing in cold houses ; it is seldom required by plants in cold frames during this month.

Continue to keep up a supply of blanched Endive, also forward Chicory, Seakale and Rhubarb ; a suitable position for these crops is under the stages of the greenhouse.

Where it is intended to grow plants in pots make certain that adequate supplies of loam, peat, manure and sand are in stock ; if possible, make provision for these materials to be stored under cover.

If not already done prune Grape Vines without delay. In cases where the Vine has been attacked by Mealy Bug remove the loose bark (but do not scrape the rods), spray with a 5 per cent. tar-oil wash provided the buds are still dormant.

Where Peach and Nectarine trees have not been pruned and trained this should be done at once before the buds begin to swell. The houses in which Grape Vines and Peaches are growing should have maximum ventilation on all favourable occasions during the present month.

THE SIZE OF EXHIBITION VEGETABLES.

At the R.H.S. Fruit and Vegetable Show held in October last, opinions were expressed by certain Fellows on the size of the vegetables exhibited, both in the Collections and in the Open Classes.

The subject was referred to Mr. WALTER F. GILES, V.M.H., one of the judges, for his opinion and comments, and his views were discussed by the President and Council. By their wish, his opinion is now printed in the Society's JOURNAL :—

At almost every vegetable show, the size of the produce shown is sure to be discussed by some one. Occasionally also, a reference is made to it in the papers, but generally speaking, the matter soon becomes forgotten until the next show comes round. I have attended most of the R.H.S. Shows and fortnightly meetings for forty-six years, and I well remember the great consternation which took place in 1913 at the R.H.S. on the question of size in vegetables.

At the R.H.S. Autumn Vegetable Show that year, the Council had arranged a class for nine kinds of vegetables which were

“ To represent the quality and size in which they are most useful for table use.”

Two chefs from London hotels were invited to do the judging. They came to the conclusion that the produce staged was not ideal for table use, and promptly condemned the two exhibits arranged for competition. This, of course, so to speak, “ put the cat amongst the pigeons ” and resulted in many letters expressing all points of view, and these appeared in the gardening press at that time. (I have them all by me.)

Some thought a standard size should be fixed, others seemed to think that it didn't matter how big a vegetable was, if it had perfect quality. It was not possible to speak of a “ perfect table size ” because this varied according to the circumstances and requirements of each case.

I think perhaps the best concise opinion was that expressed by the chef of one of London's leading hotels, who wrote as follows :—

"I think it is impossible, and moreover useless, to establish a standard size for vegetables destined to be exhibited. The first thing that should be considered by judges in an exhibition of vegetables, is the quality, considering that they are meant to be eaten and not merely to be looked at. If the quality is good, the size is important only with regard to the use to which the vegetable is to be put. Therefore to establish a standard of size, without reference to the use of the vegetable, would be absolute nonsense, and could produce no correct and practical result."

There is no doubt in my mind that this chef is right. The epicure may prefer Dwarf Beans picked when the pods have hardly formed, or Peas before the seeds have really developed, whilst those who are well to do and (or) discriminating, may like small Cabbages, Cauliflowers, or Marrows in which one specimen is just the size for one person on a plate.

The general run of middle-class people, however, would want vegetables still a little larger, whilst the artisan or worker or allotment holder will generally need still more bulk. Finally, in the catering for schools and institutions, large vegetables are most useful.

Thus, if the quality is good, every size has its uses, at some table or other, and, as the chef says, it is quite impossible to establish a standard in size without reference to the particular use of the vegetable.

The R.H.S. continued to offer this class for a number of years after 1913, but it was eventually discontinued.

In 1920 *The Times* made reference in the issue of September 22, 1920, to large vegetables at the R.H.S. Show. As a result there appeared in the R.H.S. *Book of Arrangements for 1921* (page 70) the following announcement :—

"The experience of this year's vegetable meeting and the knowledge of the awards made at the principal shows have convinced the Council that the time has come to make an effort to reform the system of judging at vegetable shows. Vegetables are primarily grown to be eaten and not to be shown, and it has therefore been decided to encourage at all future shows, the exhibition of those tender shapely specimens of moderate size which chefs and cooks rightly prefer to the monstrosities which often appear on the show table."

As regards the collection of vegetables exhibited at the October Show, I admit that the vegetables were large, but they were not coarse. They were judged strictly on the R.H.S. code of judging (1925), all done by "points," and all the specimens had quality and were suitable for someone's table.

As the rules did not confine the exhibits to being "suitable for the table of the epicure" or "for the table of a discriminating private gentleman" or even "for the table of the average householder," no objection could be taken to the size (providing the quality was perfect) except by those to whom the size exhibited did not appeal.

It must be remembered that the R.H.S. competitions are to develop horticultural skill.

Large vegetables which are perfect in quality require much skill to produce them. Those which are of the size preferred by the epicure

or specialist require little or no skill in growing. They will really grow themselves without any trouble.

From a commercial crop of Onions, or many other vegetables, it would be quite easy to pick out hundreds of perfect small specimens which would please those who like small vegetables. But these small vegetables have really no value from an exhibition point of view.

The Beans in the collections were perfectly tender and brittle and would snap quite easily; the Parsnips had much more edible matter in proportion to the size than they would have if they had been smaller; the same remark applies to the Carrots, and I have yet to be convinced that a large tender Leek is any worse than a smaller one. The Onions, of course, were too big to cook whole, but all of the bulb could be used in one way or another.

It seems to me that if the R.H.S. wish the exhibits to please all the Fellows who, it must be remembered, represent all walks of life, it would probably be necessary to divide the classes into at least three sections: (1) Vegetables of a size appreciated by the epicure; (2) Vegetables of a size appreciated by the average householder, and (3) Vegetables of a size more suitable for large households, schools, institutions, etc.

Whether such a scheme would be workable, even if desirable, I hardly know, but should imagine it would be extremely difficult to fix the limit of size for each section.

WALTER F. GILES.

APPLE 'BESS POOLE'?

THE name of this old Apple is almost invariably written as 'Bess Pool,' but "it took its name from one Elizabeth Poole" according to a letter in *The Gardener's Magazine*, Vol. VI (1830), p. 231, written by the Rev. W. T. BREE, of Allesley Rectory, near Coventry, who had "lately conversed with a brother clergyman . . . who was personally acquainted with the said Elizabeth."

A. SIMMONDS.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1944.

***Pernettya prostrata* var. *angustata*.** A.M. October 3, 1944. A dwarf, evergreen shrub with arching growths producing a number of short branchlets. The leaves are about $\frac{3}{4}$ -inch long, narrowly elliptic, set with fine, bristle-tipped teeth, and of a rich, shining green. The purplish-black berries are about $\frac{1}{2}$ -inch across, slightly less in height, and are borne singly on short stalks arising from the axils of the upper leaves of each branchlet. Exhibited by Colonel F. C. Stern, O.B.E., M.C., Highdown, Goring-by-Sea. See p. lii, vol. 69.

NOTES ON JAPANESE CHERRIES—PART III.

By COLLINGWOOD INGRAM.

It is now more than fifteen years since the second part of my "Notes on Japanese Cherries" appeared in this JOURNAL (54, 159). During the whole of that time I have been keenly on the alert for any new varieties and, in the hopes of adding to my collection, I have imported, from Japan and elsewhere, any Cherry whose name was unknown to me. With a few exceptions these introductions have been singularly disappointing. In the majority of cases the plants received have proved to be nothing more than old varieties masquerading under new names or, if not identical, at any rate so slightly different as to be barely distinguishable. All such have been ignored in the present paper: only those possessing definitely distinct characters have been included. Apart from these very few additions I have thought it advisable to draw attention to such changes in nomenclature that recent research has shown to be necessary.

As a supplement, I am offering a "Key" to all the "Sato Zakura" or "Cultivated Cherries" mentioned in this and my two previous papers. (It will be noted that the many forms of *Prunus subhirtella*, as well as the smaller wild species, have been omitted.)

It must be clearly understood that this Key makes no pretension of being anything more than a guide to their identification. Indeed, it could not be anything else.

Faute de mieux I have been obliged to base my two main categories on the colour of the flowers and that of the immature foliage. Now colour is admittedly a very unsatisfactory feature to employ as a Key character. For one thing, in plant life it is seldom constant or wholly uniform in tone, while it is only too prone to be of a fugitive nature; for another, there is an ever-present difficulty in finding an exact term to describe a particular shade or tint—even with the aid of the colour chart!

For instance, in the two main categories mentioned above, namely the colour of the flowers and that of the unfolding leaves, the shades may differ (though within certain limits) not only according to soil and season, but also according to the age of the subject. It is of the utmost importance, therefore, to bear in mind that where the bloom is concerned the headings invariably refer to the flowers *in their prime*, while those dealing with the leaves relate to the immature foliage during the initial *spring* growth, and *not* to the secondary summer growth. Furthermore, in regard to the flowers, it must be remembered that in most, if not all, the pink varieties, the unopened buds are always much darker in tone, while those of the so-called "white" varieties are generally pink-tinted before they expand. Although the flowers usually become paler with age, some darken again just before the petals fall, at which period they frequently acquire a purplish stain near the centre. A similar, though less pronounced, uncertainty exists in regard to the "doubling" of the petals. In many varieties which are normally single, individual flowers may be found with an additional petal or two, while on the other hand those of the double, or semi-double, varieties often show a tendency to become more "single" towards the end of the season. From what has been said it is obvious that these Cherries are far too variable to make a definitive Key possible: it is hoped, however, that, if used in combination

with my "Notes"—where a brief description of most of the varieties will be found—it may serve as an aid, but no more, to their identification.

Although the Key is chiefly concerned with the "ornamental," or horticultural, forms of Japanese Cherries, a few closely related wild species (but only those which might conceivably be regarded as progenitors of the cultivated varieties) have been added to make the Key as useful as possible. To show that they are spontaneous species their names have been enclosed in brackets.

Only those varieties known to me personally have been included.

ADDITIONAL VARIETIES.

KIKUZAKURA.

Prunus serrulata chrysanthemoides Miyoshi.

Coloured figure: Miyoshi (*Jap. Berg.*) t. XIX, fig. 8r.

In the spring of 1939 I received from Japan a Cherry labelled *Prunus serrulata multipetala*. Although the structure of its flowers would seem to amply justify this name, I have found that in several important respects my plant does not agree with MIYOSHI'S description of that variety. According to him the flowers of *P. s. multipetala* possess both carpel and stamens; the latter are completely wanting in my plant. Furthermore, he states that the number of petals should be about one hundred, whereas in this Cherry there are usually more than double that number—in fact I have counted as many as two hundred and twenty-three in a single bloom. The description in MIYOSHI'S monograph that most nearly fits my Cherry is the one given for *P. s. chrysanthemoides*. Despite minor discrepancies I have, therefore, decided—in the meantime, at any rate—to call it by that name.

On Japanese stock it has proved to be not only a shy flowerer, but also a slow and stubborn grower. So far, during the five years it has been in my possession, it has shown no inclination to make a tree—in fact it has not grown more than a few inches. Whether it will improve in habit when worked on *Prunus avium* remains to be seen.* It is to be sincerely hoped that its vigour will be improved by this treatment for its individual flowers are really remarkable. Developing slowly, when the blooms finally expand about the middle of May they form a densely packed, rounded boss of a soft pink colour. These measure approximately 4 cm. in diameter and are borne on long and relatively thick peduncles. The petals are so numerous and so closely crowded together that the natural shape of the flower is entirely lost—indeed they form such a congested mass that one might almost suppose that they had been artificially tied together with the idea of making a sort of floral ball. In this respect they somewhat resemble a very large edition of the flowers of the variety called Asano.

* I am more than ever convinced that the vast majority, if not all, of these Cherries thrive better—in England at any rate—when worked on our native Mazzard (*P. avium*) than they do on any of the stocks commonly employed in their own country. Very possibly this is accounted for by the difference in the climatic conditions of the two countries, that of England being, on the whole, appreciably cooler in summer and, generally speaking, much drier than that of Japan. A Japanese nurseryman who paid me a visit in 1938 was so impressed by the size and stamina of some of my trees that he begged me to send him a supply of Mazzard seed. This I did, but owing to the war I have not yet been able to hear the result of his experiment.

Kikuzakura signifies "Chrysanthemum Cherry," a meaning which is also incorporated in its scientific name. It must not be confused with the variety Okikuzakura described in Part II of my "Notes."

ITO-KUKURI.

Prunus serrulata fasciculata Miyoshi.

Coloured figure: Miyoshi (*Jap. Berg.*) t. XVI, fig. 68.

Some years ago I received a Cherry from the Cornell University, U.S.A., labelled "Washi-no-o." This turned out to be MIYOSHI's Ito-kukuri, a comparatively distinct, late-flowering variety of semi-fastigiate habit. It displays a marked tendency to produce its pale pink, semi-double flowers in bunches of loose corymbs near the end of its ascending bough—hence, presumably, MIYOSHI's name *fasciculata*.

Although a sufficiently attractive variety with medium-sized flowers, it cannot be regarded as being in the first rank.

HIYODORIZAKURA.

Prunus serrulata longipedunculata Miyoshi.

Coloured figure: Miyoshi (*Jap. Berg.*) t. XIX, fig. 86.

It was in 1939 that I imported this Cherry from Japan. So far it has not proved to be as ornamental as MIYOSHI's figure would lead one to suppose. For one thing, it appears to be a rather shy bloomer, and for another it has a weak, somewhat ungainly habit of growth—on Japanese stock at any rate.

As its varietal name suggests, the stalks of the inflorescence, and in particular the peduncle, are notably elongated. These possess the unusual characteristic of being sparsely hairy. The flowers, which are late in opening, are of fair size, distinctly double and of a pleasing rosy-pink colour.

KUMAGAYA.

Prunus serrulata kumagaya Ingram, nov. comb.

During my visit to Kohoku—an outlying suburb of Tokyo—in 1926, I was shown a Cherry of the above name. It has smallish double white flowers of comparatively little ornamental value. The inflorescence was characterized by the remarkably short, almost invisible peduncle. This variety does not appear to have been introduced either into England or America and is seemingly very rare in its native country. No reference to this Cherry is made in any of the works that I have had the opportunity of consulting. Another white-flowered variety seen on the same occasion was one called Shirayuki. PAUL RUSSELL includes a Cherry of this name in his brochure, where he describes it as an attractive variety somewhat resembling Yoshino in appearance. As the specimen I saw bore no resemblance to Yoshino and was, moreover, completely lacking in charm, it seems probable that we do not refer to the same plant.

IMOSÉ.

Prunus serrulata imose Ingram, nov. comb.

It was during my visit to Japan in 1926 that I first came across this Cherry. I found it among the trees growing in the grounds of the Hirano Shrine, Kyoto. As the variety was not represented in my collection, or any other known to me, I asked Count KAJUJI if he would kindly send me some scions during the following winter, and this he was good enough to do.

Imosé is not mentioned in MIYOSHI'S *Japanische Bergkirschen*, nor does it appear to have been recorded in any other work that has been published in a European language. It has, however, been figured (and probably described) in a Japanese book by MASUHIKO KAYAMA.

On the whole this is a fairly distinct variety, being characterized, even when out of flower, by its rather paler and more dense and glistening foliage. Compared with other forms, the young leaves, too, are distinctive, being of a bright copper-red colour; indeed they are sometimes so vivid in tone that they might almost be described as shrimp-red. The soft mauvy-pink flowers are completely double, having from twenty-five to thirty petals: they are borne in rather long, loose corymbs containing from three to four blooms each. A peculiar feature about this Cherry is that a large proportion of its fruits appear as twin drupes on the same pedicel.

Imosé appears to have a good constitution and with its attractive foliage and vigorous habit of growth promises to make a long-lived and handsome tree. Even though its flowers be somewhat weak in tone I regard this Cherry as a very definite acquisition to horticulture.

The foliage usually remains green until well into November: it then turns to a deep golden-yellow prior to falling.

CORRECTIONS IN NOMENCLATURE.

SARGENT'S CHERRY.

Prunus Sargentii Rehder.

Synonyms: *P. sachalinensis* Schmitt (Ingram, *Journ. R.H.S.*, 1925 and 1929, No. 1); *Cerasus Lannesiana* Carrière? (*Rev. Hort.*, 1872).

Coloured figure: Miyoshi (*Jap. Berg.*) t. IX, fig. 31; and as *Cerasus Lannesiana* in *Rev. Hort.*, 1873 (?). The figure in the *Bot. Mag.* (t. 8411) does not represent the same species.

As pointed out in the *Gardeners' Chronicle* (Sept. 14, 1940) there appears to be a very good case for adopting CARRIÈRE'S name for this species. There exists, however, an element of doubt and, slight though it may be, it is perhaps expedient, in the meantime at least, to retain REHDER'S more familiar epithet for this very lovely and now well-known Cherry. One thing is certain, the specific name used in my "Notes"—*sachalinensis*—although ante-dating *Sargentii*, is definitely not a valid one and a correction of some kind is therefore necessary.

HILL CHERRY (SHIRO-YAMAZAKURA).

Prunus serrulata var. *spontanea* (Max) Wilson.

Prunus serrulata var. *pubescens* Wilson.

Synonym: *Prunus mutabilis* Miyoshi (Ingram, *Journ. R.H.S.*, 1925 and 1929, No. 2).

Coloured figures : Miyoshi (*Jap. Berg.*) t. VI, VII and VIII, figs. 1 to 26.

Elsewhere in the JOURNAL (69, Pt. 5) I have given my reasons for assuming that the Hill Cherry is not a true native of Japan, but I also suggested that, during the course of its long residence in that country, the glabrous form had evolved certain minor differences which have now rendered it distinguishable from its Chinese prototype. The pubescent form, which may be indigenous, though I believe it was originally introduced from Korea, does not appear to have become recognisably distinct. The nomenclature of the glabrous variety, commonly known as Yamazakura in Japan, has been fully discussed in the *Gardeners' Chronicle* of March 18, 1944. Therein I have shown the necessity of abandoning MIYOSHI's specific designation—*mutabilis*, the name under which it was referred to in my "Notes."

SHIMIDSU SAKURA.

Prunus serrulata Shimidsuii Ingram (*Gard. Chron.*, 1941, p. 240).

Synonyms : *P. s. longipes* Miyoshi ; "Oku Miyako" Ingram (*Journ. R.H.S.*, 1925 and 1929, No. 19).

This is the Cherry I called Oku Miyako in my "Notes" and is, I believe, the variety that Mr. PAUL RUSSELL named Shogetsu in his *Oriental Flowering Cherries* (1934), although it must be confessed his brief description does not agree in every respect. Unfortunately, according to the laws of priority, the use of neither of these names is permissible, both having been previously employed by Prof. MIYOSHI when describing two different forms of Japanese Cherries (cf. *Japanische Bergkirschen*, 1913). As I explained in the *Gardeners' Chronicle*, a more precise and detailed translation of MIYOSHI's diagnoses in German has proved conclusively the inadmissibility of either appellation. Having failed to find a fitting description of this now well-known variety in MIYOSHI's monograph, or in any other publication, I have been reluctantly obliged to give it a new name. In so doing I have chosen to honour the memory of a great Cherry lover—one KENYO SHIMIDSU. Had it not been for this man's devoted care of the famous collection at Kohoku at a time when horticulture was at its lowest ebb in Japan, it is almost certain that many of the most beautiful varieties would have been lost to the world for ever.

The following description of *P. s. Shimidsuii* is taken from my article in the *Gardeners' Chronicle*.

A small tree seldom exceeding 5 metres in height. The broadly spreading branches form a more or less flattened crown. The variety is characterized by the exceptional length of its lax and completely pendulous corymbs. These, composed of from three to six flowers, measure up to 16 cm. or 17 cm. in length, the pedicels in particular being notably long. The flowers, which are pale pink in the bud stage, are pure white when fully opened. They are semi-double, of a flat shape, and measure about 5 cm. across. The margins of the petals are irregularly incised, and this gives the edge of the flower a somewhat frilled appearance. Mostly there are two leafy carpels in the centre of each bloom. The leaves are bronze-green when unfolding.

To the minds of many people the flowers, with their two green carpels projecting from the centre of the wide-spreading, fringed petals, suggest the legs and skirt of a diminutive ballet dancer.

In Kioto this Cherry is apparently known colloquially as Nadishiko Sakura. As this name means "Dianthus Cherry" it would have been a very appropriate one to use since the open flowers are distinctly reminiscent of those of a Pink. But here again we have been forestalled by MIYOSHI, who has employed the epithet for another variety, which he has described as *P. s. var. dianthipetala* in the *Tokyo Botanical Magazine*, XXXVI (1922).

MIKURUMA-GAESHI.

Prunus serrulata diversiflora Miyoshi.

Synonym: *P. s. temari* Miyoshi (Ingram, *Journ. R.H.S.*, 1925 and 1929, No. 15).

Coloured figure: Miyoshi (*Jap. Berg.*) t. XV, fig. 61.

The native name Mikuruma-gaeshi seems to have been somewhat loosely applied to several more or less distinct pink-coloured varieties. The epithet is no doubt popular with the Japanese because of its historical significance. It is said to commemorate an incident in which a former Emperor was so impressed by the beauty of a certain tree that he ordered his equipage to return in order that he might have an opportunity of admiring it again. According to PAUL RUSSELL the literal translation of Mikuruma-gaeshi is "The Royal Carriage returns."

In my first efforts to clarify the nomenclature of the Japanese Cherries, regarding E. H. WILSON as an authority on the subject, I foolishly accepted his identification of the Kew specimen of this variety. This he called Temari, which I now know to be a different form. Consequently, wherever I have used the name Temari in my previous writings (*Journ. R.H.S.*, 1925 and 1929, and *Flowering Trees and Shrubs*, p. 151) Mikuruma-gaeshi should be substituted.

It is easy to understand how WILSON made his mistake for, in his *Cherries of Japan*, he erroneously followed KOIDZUMI in describing the flowers as being "double and of a pale rose colour." In the Kew tree, as in MIYOSHI's description, they are mostly single with only a very occasional extra petal. It is but fair to mention, however, that in the photograph published in M. KAYAMA's book dealing with the famous Omura collection, Mikuruma-gaeshi is shown as a double variety. But on this, as on all other occasions, where MIYOSHI leaves little doubt as to the identity of a variety I have felt obliged to adopt his nomenclature, for he is not only the first, but the only writer to figure and describe all the Japanese cultivated Cherries scientifically and in minute detail.

In its habit of growth Mikuruma-gaeshi is a very distinct variety for, if left unpruned, it will produce long ascending boughs with very few, or no, lateral branches. Along these boughs numerous short spurs are formed, and on nearly all of these clusters of relatively large, blush-pink flowers appear in the spring. The well-shaped blooms, which measure up to 5.2 cm. in diameter, are mostly, though not invariably, single. In old trees the compact short-stalked form of the corymb gives the inflorescence a bunched and somewhat characteristic appearance. Unfortunately Mikuruma-gaeshi from its manner

of flowering is liable to suffer from brown-rot * and should therefore be given an open and airy situation. It is a very desirable and lovely Cherry. The flowering period is about mid-season.

SUPPLEMENT.

KEY TO THE "CULTIVATED" JAPANESE CHERRIES.

I. FLOWERS WHITE WHEN FULLY EXPANDED

(A) YOUNG LEAVES GREENISH, GOLDEN-GREEN, OR BRONZE-GREEN

(B) Flowers Single

(C) All parts Glabrous †

Prunus serrulata *affinis*. "Jo-nioi"

P. s. caudata. "Tora-no-o"

P. s. wasi-nowo. "Wasli-no-o"

P. s. hatazakura. "Hatazakura"

(*P. speciosa*.) "Oshimazakura"

(CC) Some parts more or less Pubescent

(*P. serrulata* var. *pubescens*.) "Shiro-yamazakura"

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

P. s. Shimidsuii. "Shimidsu Sakura"

P. s. kumagaya. "Kumagaya"

(AA) YOUNG LEAVES COPPERY-RED, REDDISH-BROWN OR REDDISH

(B) Flowers Single

(C) All parts Glabrous

P. s. tai-haku. "Tai-haku"

P. s. surugadai-odora. "Surugadai-nioi"

P. s. cataracta. "Taki-nioi"

(*P. serrulata* var. *spontanea*.) "Shiro-yamazakura"

(CC) Some parts more or less Pubescent

P. s. fudanzakura. "Fudanzakura"

(*P. serrulata* var. *pubescens*—(some forms).)

"Shiro-yamazakura"

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

P. s. albo-rosea. "Shirofugen"

* Brown Rot Fungus, *Monilia cinerea* (*Sclerotinia laxa*). Infection occurs chiefly through the open flowers from the fungal fructifications produced on the dead twigs which were attacked during the previous year. (Cf. JOURN. R.H.S., 67, Pt. 8.) Varieties that form flowering spurs on the old boughs are, therefore, very liable to have their main branches attacked when the fungus spreads down the woody stems of these spurs. The lesions thus formed will sometimes destroy the whole bough.

† Most species and varieties are pubescent in the seedling stage. These headings refer to the mature tree.

II. FLOWERS PINKISH-WHITE OR VERY PALE PINK WHEN FULLY EXPANDED

(A) YOUNG LEAVES GREENISH-BRONZE OR RUSTY BRONZE

(B) Flowers Single

(C) All parts Glabrous

- P. s. ojochin.* "Ojochin" *
P. s. moutan. "Botan-zakura"
P. s. ariaki. "Ariaka"
P. s. ruiran. "Ruiran"
P. s. erecta. "Amanogawa"

(CC) Some parts more or less Pubescent

- P. yedoensis.* "Yoshino"
P. yedoensis purpendens. "Shidare Yoshino"
(*P. serrulata* var. *pubescens* (rarely).) "Yamazakura"

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

- P. s. unifolia.* "Ichiyo"
P. s. fasciculata. "Ito-kukuri"
P. s. shujaku. "Shujaku"

(AA) YOUNG LEAVES COPPERY-RED, REDDISH-BROWN OR REDDISH

(B) Flowers Single

(C) All parts Glabrous

- P. s. rubida.* "Benden"
(*P. serrulata* var. *spontanea*—(some forms).)
"Yamazakura"

(CC) Some parts more or less Pubescent

- (*P. serrulata* var. *pubescens*—(rarely).) "Yamazakura"

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

Several unnamed seedlings raised at Benenden.

III. FLOWERS DEFINITELY PINK OR DEEP PINK WHEN FULLY EXPANDED

(A) YOUNG LEAVES GREENISH-BRONZE OR BROWNISH-BRONZE

(B) Flowers Single

All parts Glabrous

- P. s. conspicua.* "Oshokun"
P. s. diversiflora. "Mikuruma-gaeshi"

* This variety was erroneously named *P. s. senriko* in Part I of my "Notes"; the mistake was corrected in Part II. I have not used MIYOSHI's varietal name as his 'Ojochin' does not appear to be the same as the Cherry commonly known as such in Japan.

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

- P. s. okikuzakura.* " Okikuzakura "
- P. s. chrysanthemoides.* " Kikuzakura "
- P. s. daikoku.* " Daikoku "
- P. s. horinji.* " Horinji "
- P. s. versicolor.* " Yae Akebono "
- P. s. rosea.* " Kiku Shidare Zakura "
- P. s. Geraldinae.* " Asano "
- P. s. hokusai.* " Hokusai "
- P. s. nobilis.* " Yedo Zakura "
- P. s. homogena.* " Kokonoye Sakura "
- P. s. subfusca.* " Sumizome "

(CC) Some parts more or less Pubescent

- P. s. longipedunculata.* " Hiyodorizakura "

(AA) YOUNG LEAVES COPPERY-RED, REDDISH-BROWN OR REDDISH

(B) Flowers Single

All parts Glabrous

- P. s. splendens.* " Hisakura "
- (*P. Sargentii.*) " Oyamazakura "

(BB) Flowers Semi-Double or Double

(C) All parts Glabrous

- P. s. sekiyama.* " Kanzan "
- P. s. atrorubra.* " Kirin "
- P. s. fugenzo.* " Fugenzo "
- P. s. taoyoma.* " Taoyoma "
- P. s. purpurea.* " Yae Murasaki Zakura "
- P. s. imose.* " Imosé "

(CC) Some parts more or less Pubescent

- P. sieboldii.* " Takasago " or " Naden "
- P. taizanfukan.* " Taizanfukan "

IV. FLOWERS GREENISH-YELLOW or YELLOWISH WHEN FULLY EXPANDED

YOUNG LEAVES REDDISH-BROWN

Flowers nearly Single or Semi-Double

- P. s. grandiflora.* " Ukon "
- P. s. grandiflora.* Sub-form " Asagi "
- P. s. gioiko.* " Gioiko "
- P. s. kabazakura.* " Kabazakura "



Photo, N. K. Gould

FIG. 1.—JAPANESE CHERRIES AT WISLEY



Photo, Wilh.

Fig. 2. RHODODENDRON LEUCASPIS
(See p. 23.)



Photo Malin

FIG. 3 RHODODENDRON CULPINENSE
(See p. 22)



FIG. 4 - *HYALUS* AND *STREPTALICEPTUS* SHALLOWS PLANTED ALTERNATELY, TEN WEEKS AFTER PLANTING.
(See p. 27)



FIG. 5 STRIPE ON AUTUMN-SOWN ONIONS
(See p. 24.)

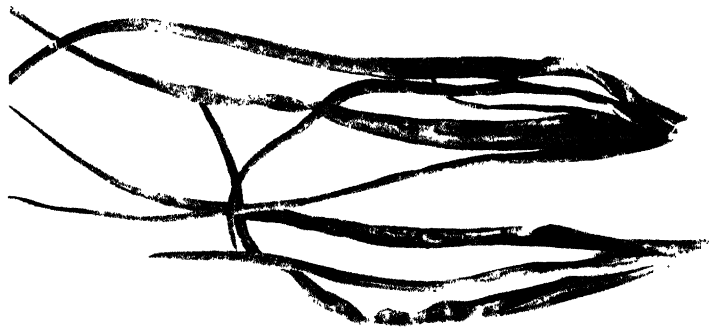


FIG. 6 STRIPE ON SPRING-SOWN ONIONS
(See p. 25.)

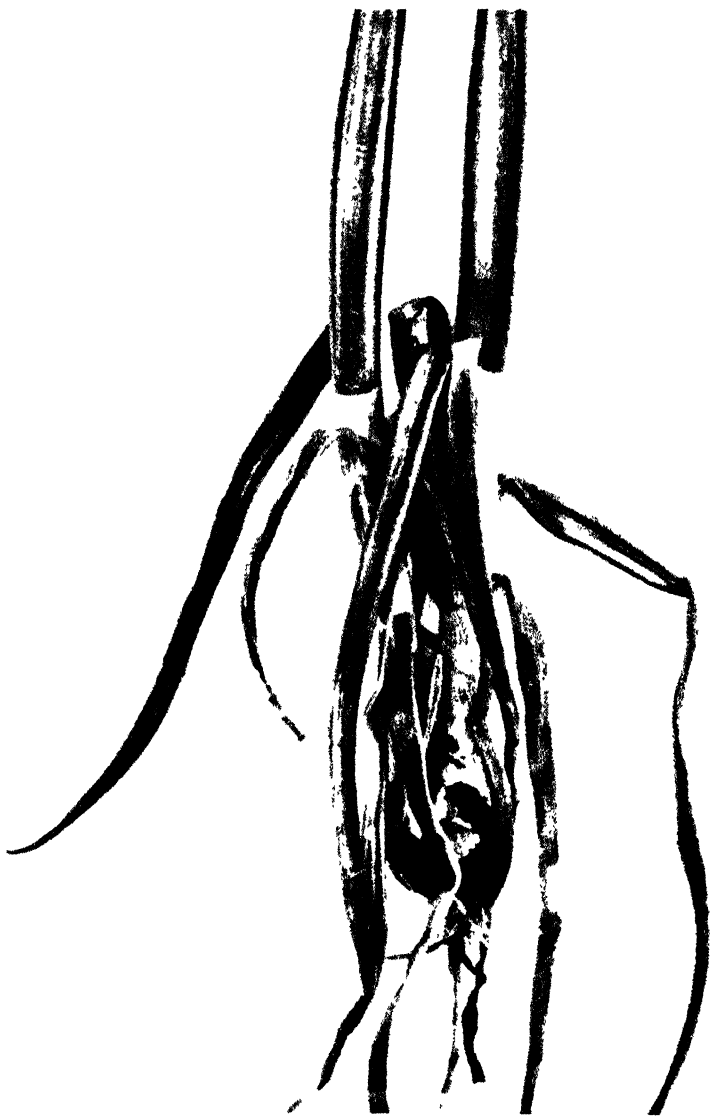


FIG. 7—ONION SEED PLANT WITH STRIPED LEAVES AND FLOWER STALKS.
(See p. 24)



FIG. 8. *SOLIDAGO* 'LUNIFOLIA,' AWARD OF MERIT, 1944
(See p. 31.)



Photo. A. G. King

FIG. 9.—CHRYSANTHEMUM LILLIPUT HONEYBIRD. AWARD OF MERIT, 1944

WHO WAS JOHN HOLLYBUSH?

IN the Hon. Mrs. EVELYN CECIL's *History of Gardening in England* there is a valuable List of English Printed Books on Gardening chronologically arranged down to the year 1837. Here is recorded under the date 1561 a book entitled "A most excellent and Perfecte Homish Apothecarye or homely physick booke, . . . Translated out of the Almaigne speche . . . by IHON HOLLYBUSH. A. BIRCKMAN, Collen, 1561. Folio."

This work is frequently found bound up with the two parts of WILLIAM TURNER's *Herbal* (1551 and 1562), and Mrs. CECIL suggests that JOHN HOLLYBUSH was a pseudonym for WILLIAM TURNER. This WILLIAM TURNER was an M.A. of Pembroke Hall, Cambridge, a physician and botanist, and a friend of RIDLEY and LATIMER. After travelling abroad he became chaplain and physician to the DUKE of SOMERSET, a member of Parliament, a prebendary of York, and in 1550 Dean of Wells. In 1553 he was deprived, and lived abroad during MARY's reign. In 1560 he was reinstated in his deanery, but was suspended in 1564 and died in 1568. He is said to have introduced Lucern into England, and his *Herbal* marks the beginning of scientific botany in this country.

But the name of JOHN HOLLYBUSHE also appears on an edition of MILES COVERDALE's New Testament published in 1538. Of this *Latin-English Testament* there are in fact three editions. The first was printed by a Southwark printer, JAMES NICOLSON, in 1538, and dedicated to KING HENRY VIII. This was while COVERDALE himself was in Paris, and the edition was disowned by him as inaccurate; accordingly he revised it and printed a new edition in Paris in the same year, dedicated to Lord CRUMWELL. NICHOLSON, however, put out another impression of his edition—thus the third edition—under the name of JOHN HOLLYBUSHE.

From this it has been inferred that JOHN HOLLYBUSH was a pseudonym for MILES COVERDALE, Bishop of Exeter (1551-1553), most famous as the translator of the Prayer Book version of the Psalms.

Neither of these guesses, however, proves to be correct. Mr. E. G. DUFF, a learned bibliographer in the University Library at Cambridge, has pointed out that JOHN HOLLYBUSH was a real person. He is the HANS VAN RUREMONDE, who was connected with the Antwerp Testaments. He appears in FOXE's *Book of Martyrs* as "John Raimond a Ducheman" who did penance for selling them in London. In 1535 he took out letters of denization as "*John Holibusche* of London, stationer, otherwise bokebynder, born in Ruremond under the obedience of the Emperor" (*Huguenot Society's Publications*, VIII, 125).

JAMES NICOLSON, the printer who employed him, published a number of medical and theological books, such as the following:

A myrrour or glasse for them that be syke and in payne translated out of Dutche into Englishe. Mat. XI, "Come unto me all ye that laboure, and are laden and I wyll ease you." Prynted in Southwarke by Mr. James Nicolson for Jan Gough, Cum Privilegio Regali.

A goodly treatise of faithe, hope, and charite translated into englyshe. Prynted in Southwark, for James Nicolson, MDXXXVII.

The original and sprynge of all sectes and orders by whome, when or were they beganne translated out of hye Dutch into Englysh. MDXXXVII. Printed in Southwarke by Mr. James Nicolson, for Jhon Gough, Cum Privilegio.

Bullinger (Heinrich). *A commentary upon the seconde Epistle of St. Paul to the Thessalonians.* Prynted in Southwarke in St. Thomas hospytall by James Nicolson 1538. (Translated into Englyshe by R. H.)

Regius (Urbanus). *A comparison betwene the Olde learnynge and the newe* translated out of latyn into Englysh by WylIAM Turner, 1538. Printed in Southwarke by Mr. James Nicolson.

JOHN HOLLYBUSH himself is known to have been the translator of at least two doctrinal treatises (*cf.* BROOK'S *Puritans*, I, 120 ; FOXE, VIII, 786 (ed. Towns)).

The full title of the book translated by HOLLYBUSH mentioned in Mrs. CECIL'S list is : *A most excellent and perfecte homish apothecarye, or homely physick booke for all the grefes and diseases of the bodye.*

The book was printed at Cologne by ARNOLD BIRCKMAN. It is a translation of *Thesaurus Pauperum* by HIERONYMUS BRUNSCHWEIG (1537). It is a quaint and amusing work.

The first chapter is *concerning the head and his partes :*

For fallinge of the heyre of the head : Make lye of the ashes of doves dounge, and washe the heade therewyth. But if ye cannot get doves dounge, take leaves of oken tre, and seth the middelmost rippes of them in water, and wash the head therewith, letting it dry by it selfe, it helpeth very well. Or else take the ashes burnt of little frogges, make a lye therewyth, wash the head oft therewyth, that hindreth the falling of the heyre.

Another chapter is entitled :

For lyse and nittes.

Take the heads of herbe Sitt or Nigella, and burne them to ashes, put swynes grese thereto, and strake or kemme the heyres therewyth, that dryveth away lyse and nittes.

Another chapter heading is :

A wonderfull experience for the headacke.

Set a dish or platter of tynne upon the bare head filled with water, putte an once and an halfe, or two onces of molten leade therein, whyle he hath it upon the head. Or els make a garlande of Wervayne, and wear it daye and night, that helpeth wonderfully.

Other chapter headings are similarly alluring :

Of whirling in the heade

When a man can not slepe

To knowe whether a man be possessed wyth an evill spirit, and how he may be holpen.

A sure medicine for toothake

To make teth fall out without smart

Of all diseases of the bellye, and hys parts annexed

And so he goes on for forty-five double pages folio—ninety pages altogether. It is curious to reflect how crude in the sixteenth century were both the Beginnings of Science and the Reformation of Religion : but the Beginnings proved to be real beginnings and the Reformation a real reformation.

J. W. HUNKIN,

PLANTS FOR THE WINTER GARDEN.

By FRANCIS HANGER.

It is mid-winter, early in the New Year.

Let us wander through a garden whose owner has availed himself during the past generation or so of the opportunities afforded by such plant explorers as WILSON, FARRER, FORREST, and KINGDON WARD, to increase his collection of treasures, by acquiring the new introductions from the various exploration. No doubt if the interest is so keen, the garden will be in one of the favoured districts of Great Britain, that is, in the south of England, Devon, Cornwall, north or south Wales, or the south-west of Scotland. Among the new introductions will be a good percentage of new *Rhododendron* species.

Strolling thoughtfully along, we shall be impressed by the many different species which if not winter bloomers are longing to exhibit their beauty at the first mild spell of early spring.

Being such a keen horticulturist the owner probably has encouraged his gardener to hybridize various species, making far more variety and interest. What a list of plants there is to choose from to make a joyous "Winter Garden." If our ambitions are less exacting, we can at least find a wealth of material for that considered warm spot, neatly hidden away from the cold winds with just enough natural covering overhead. No doubt the reader queries the wisdom of advocating such a precarious type of gardening, so dependent on the extremes of our changeable English weather, when to get a sure return, June flowering trees and shrubs are the safest investment. *Rhododendron* 'Pink Pearl' or *R.* 'Purple Splendour' no doubt are far more easily accommodated, and when in full bloom have their admirers, yet they cannot give to the owner or grower the joy of visiting a drift of *Rhododendron mucronulatum* (bright rosy-purple) intermixed with *Hamamelis mollis* (yellow) on New Year's Day.

Of course all gardens have not the secluded corners or warm woodlands, nor are they in favourable districts, nor have they room for a collection of doubtful winter and early bloomers, yet almost every garden "be it ever so humble," can have its winter garden in proportion. It may only be the common yet beautiful *Jasminum nudiflorum* on the wall of the house, enabling the owner to decorate his dining-table with cut sprays of golden-yellow blossoms on Christmas Day. His *Iris unguicularis* (*stylosa*) at the foot of the south wall may have been generous and provided a few blue flowers to mingle with the yellow Jasmine, forming a combination of colours always pleasing to the eye.

Perhaps before we commence our stroll through our imaginary winter garden it should be pointed out that the majority of the plants mentioned, although early bloomers, are more or less hardy woodland plants; it is quite different from attempting to cultivate too many half-hardy plants only to lose them all during the first severe winter.

Rhododendron moupinense will be found in a secluded spot with quite a canopy overhead to shield it should there be a slight frost during its early flowering season of February, and near by the pink form looking so lovely mixed with the white blooms of *R. moupinense*

itself. Perhaps as edging plants to the larger species of Rhododendrons, various hybrids of this Rhododendron will be used. Bodnant's triumph, *R. Cilpinense* (*moupinense* \times *ciliatum*) should be conspicuous with its very neat bushy habit and shining leaves, very beautiful in bud and magnificent in flower during mild spells of March, one of, if not the very best dwarf early flowering Rhododendron. See Fig. 3.

R. 'Bric-a-Brac' (*moupinense* \times *leucaspis*) flowers a little before *R. Cilpinense*, and has much the same habit but with flatter flowers. The same species crossed with *R. lutescens* gives us *R. 'Bo-Peep'*, sulphur-yellow in colour, and of course hybridized with *R. praecox* it makes that lovely Tower Court hybrid *R. 'Tessa'*.

The Camellias well protected from the north and east catch the eye with their glorious rich-looking foliage. *C. Sasanqua* has been in bloom since early December, but *C. japonica* hybrids will not bloom until March and April, yet very early we shall have *C. saluenense* with its many Dog-rose-like blossoms brightening the woodland for a considerable time. *C. reticulata* (wild form), although not such a prolific bloomer, is just as hardy and has larger, richer, rose-coloured flowers. No doubt the masterpiece of this type of Camellia is the Caerhays hybrid 'J. C. Williams,' which tries to bloom itself to death each year. This excellent plant has everything to recommend it, for it is quick growing, of bushy habit, exceedingly free flowering and has been known to withstand a temperature down to zero without the least sign of harm—an early flowering shrub worthy of the name it bears.

A hedge of *Viburnum Tinus* (*Laurustinus*) borders the winter garden on the north and east, and serves two purposes: it helps to stop the ground draughts, caused by the wind break of conifers losing their lower branches, and its white flowers from December until late March are most welcome. On the south border *Rhododendron lutescens* makes a unique hedge, and gives a pretty sprinkling of small yellow flowers from February right through March. Jack Frost sometimes plays havoc with it, but it comes again the first mild spell.

Planted well in the rear on the south-east corner with the background of conifers are large trees of *Prunus subhirtella autumnalis*, whose very pale pink flowers will often gladden the eye during mild winter periods. As dot trees among the masses of Rhododendrons various early flowering *Prunus* may be seen: *P. Davidiana* and its variety *alba* are amongst the earliest of bloomers, to be followed in March with that beautiful Almond, *Prunus Amygdalus Pollardii*.

That very exquisite Rhododendron species *R. calophytum* needs plenty of moisture, but what a handsome foliage shrub it is if given enough room. During March, when covered with its trusses of white bell-shaped flowers with a deep dark blotch, it is indeed first class. *R. sutchuenense* will be in flower a good month before *R. calophytum*, as will *R. praevenum* which it resembles. *R. Ririei* with its dull purple flowers early in February is quite a change and is generally a favourite with the ladies. The same may be said of its hybrid 'Maya,' *Ririei* \times *sutchuenense*. *R. arboreum* adds height to the plants with its pyramidal shaped trees, but only the white and pink forms are really successful outside, the blood-red type is very tender. That marvellous Rhododendron *R. barbatum*, with its bright crimson flowers, is wonderful in March, as also is its offspring *R. Shilsonii* (*barbatum* \times *Thomsonii*). At this period we have a feast of glorious reds in *R. 'Alix'* (*barbatum* \times *Hookeri*), *R. 'Abbot'* (*Thomsonii* \times *Delavayi*) and *R. 'Red Admiral'* (*arboreum* \times *Thomsonii*). A medium-sized Rhododendron species is

R. Stewartianum with flowers of various shades, pink, white, cream and primrose-yellow. Unfortunately the least frost seems to spoil its flowers, but given a mild time early in March it is most attractive. *R. sinogrande* and *R. Falconeri* will not flower until much later, but the warmer sheltered winter garden suits them, and their noble foliage and stately habit are handsome to look upon at all seasons. Quite a contrast is *R. leucaspis*, only 1 to 2 feet high, but its lovely white flowers quite repay any trouble required to find that extra sheltered spot to enable the blooms to open during February (Fig. 2). *R. pemakoense*, much later in blooming, is of the same dwarf habit. In this winter garden we are bound to have disappointing mornings when sharp frosts clear the shrubs of many flowers, yet if we plant wisely we shall have our consolations, with drifts of *Galanthus* in the grass beneath the tall woodland trees, together with *Eranthis hyemalis* (Winter Aconite) or the Hellebores planted as edging along the paths. *Helleborus niger*, the Christmas Rose, followed later by the various coloured Lenten Roses, are also most welcome. In the more open part of the winter garden to the west side we have the various winter-flowering Ericas. *E. lusitanica* is a tall, graceful shrub, with a pleasing green foliage and white flowers during January onwards, followed later by *E. Veitchii* of similar habit. Of the dwarf creeping Heathers, 'Springwood White' stands out with long racemes of flowers. *E. darleyensis* is so well known and such an easy doer that no description is necessary. *Erica carnea* and its varieties, outstanding of which are 'King George' and *praecox rubra*, all help to bring cheerfulness to the early months of the New Year. *Mahonia lomariifolia* will have lost its terminal tuft-like cluster of yellow flowers by the end of the old year, but *M. japonica* will continue to scent the garden with its Lily-of-the-Valley scented flowers over a long season of flowering from January onwards.

Viburnum fragrans, also sweetly scented, will be displaying its pale pink and white clusters of flowers at every mild break in the weather. The Australia native, *Acacia dealbata*, in the snugest of corners, is just beginning to unfold its fluffy yellow flowers to add to the beauty of its elegant foliage, and near by the Lily-of-the-Valley-like flowers of *Pieris japonica* still hold their own amongst the elect of plants.

Claim is only made to have mentioned a few of the many beautiful flowering winter trees and shrubs. The omission of such favourites as *Garrya elliptica*, *Chimonanthus fragrans*, *Daphne Mezereum*, *Prunus Conradinae*, *Daphne odora*, and the early flowering hybrid Rhododendrons 'Christmas Cheer,' *Nobleanum*, *Nobleanum album*, *Nobleanum venustum*, etc., may disappoint some readers, yet it helps to prove the vast collection of plants we have at our disposal to cheer the dull winter months. As we bid farewell to our winter garden we glance back to catch a distant view of *Magnolia Campbellii* and *M. salicifolia* already set with flowering buds waiting to unfold when March is here.

A SUSPECTED VIRUS DISEASE OF SHALLOTS AND ONIONS.

By D. E. GREEN, M.Sc., Mycologist, Wisley.

FOR the last seven or eight years there have been repeated reports of unsatisfactory growth in various stocks of Shallots and, to a less extent, Onions. In general the complaints refer to lack of vigour and a yellowish striping on the foliage. Striping of Shallot foliage was noted in Somerset in 1936, on Onions in Cambridge in 1938, and in the writer's experience was present on Shallots in cottage gardens in Surrey in 1938. The first written description of the symptoms was published by OGILVIE and WALTON in 1940 (1) and since then the trouble seems to have become far more common and has been reported from many counties. Most reports are concerned with Shallots, on which the signs are perhaps the most noticeable, but there is no doubt that the same trouble is often present in Onions whether spring sown, autumn sown, or seed crop plants. It is also seen in Potato Onions and Leeks. In 1940 Shallots growing in the vegetable trial ground at Wisley were not at all satisfactory in growth and there was little doubt that the cause was similar to that mentioned above. Owing to the war, little has been done to discover the reason for such unhealthy symptoms and although it seems fairly certain they are due to virus infection definite proof of this will need investigation at one of the virus disease research stations. In the past few years, however, the writer has carried out some small experiments with affected stocks and has collected data from field crops of Shallots and Onions showing this trouble. This article is written to describe the symptoms of the disease and to record the information so far obtained.

SYMPTOMS.

(a) *Shallots*. The most severe symptoms are seen in Shallots. There is a marked stunting and twisting of the leaves, which tend to be crinkled and yellowish-green in colour. Such foliage is inclined to droop and die off early. Where the plants are well fed the symptoms may be somewhat masked, but the affected ones begin to droop their leaves long before healthy ones. The bulbs, although sound, are reduced in size and deterioration is more marked each season.

(b) *Onion plants grown for seed*. The signs on Onion plants grown for seed production are usually most distinct, probably owing to their having been infected in the previous season so that the virus is well established in the plant. Yellow stripes appear on the leaves but are more obvious on the flower stem. The stripes on the flower stem vary from slightly yellow to almost white broad stripes running down the stem and this seems a most reliable symptom. The affected striped leaves fall and wither earlier than healthy ones but the seed stalk grows and produces its seed head in the usual way. In most cases observed, stunting of the flower stalk could not be described as severe but there is a reduction in weight of seed (Fig. 7).

(c) *Autumn-sown Onions*. Although not so obvious as on plants growing for seed, the symptoms are clear on autumn-sown plants, showing as yellowish streaking or striping in the leaves with some crinkling and a general lighter green colour. The foliage is often rather flattened and limp and not so vigorous as healthy leaves. The crinkling is not always a good symptom as it may be seen on foliage which is apparently healthy. The yellow streaking is often plainest on the young inner leaves but must not be confused with discolorations due

to bruising or injuries caused by wind rubbing the leaves together (Fig. 5).

(d) *Spring-sown Onions*. Even in spring-sown Onions the symptoms are sufficiently clear at three months old for leaves to show yellowish striping and a suggestion of crinkling and limpness, the plant being slightly stunted and a lighter green (Fig. 6).

(e) *Onion sets*. Onion sets are not yet produced on any large scale in Great Britain so that there is little information about this trouble in them. In America, however, TATE (2) places on record the fact that in Iowa the yellow dwarf disease of Onions is largely confined to one district and remarks that this is "owing possibly to the fact that the commercial Onion crop in this district is grown from sets, which constitute the principal overwintering source of the virus." In the event of any development of the production of Onion sets in this country it would be as well for growers to bear the above remarks in mind.

(f) *Leeks*. The symptoms in Leeks are typical as yellowish stripes of varying width down the leaf blades.

OBSERVATIONS IN OTHER COUNTRIES.

In America there is a disease of Onions with very similar symptoms which was noticed by Onion growers in Iowa in 1927 and was much more extensive in 1928. By 1929 workers at the Iowa State Experimental Station (3) had found it to be of a virus nature and suggested the name "Yellow Dwarf" as being most suitable in view of the two most obvious symptoms, i.e. yellowing and stunting. By 1933 the same workers had gained further knowledge of the virus, its host range and its vectors (see under "Spread" later) and had concluded the disease was probably present in America as early as 1916.

The first suggestion of an Onion virus outside America was made by BREMER (4) in Germany in 1929. He reported a similar disease in several parts of Germany and although comparing it with the American one he named it "Rotzkrankheit" or "Slime" disease. In 1937, however, BREMER (5) in a further paper admitted the unsuitability of the term "Slime" disease and suggested the name "Yellow Streakiness" although he considered it similar to the American "Yellow Dwarf." In 1937 also ANDREYEFF (6) in Russia reported a virus in Onions in the U.S.S.R. very similar to the American and German diseases, but he left open the possibility that the chlorosis and stunting of the flower stalks in seed crops may be due to Onion mildew. In 1939 the disease was reported by CHAMBERLAIN and BAYLISS (7) in New Zealand and was called "Yellow Dwarf" (*Allium Virus 1*) as it was similar to the American and German disease. It was considered a serious disease and was therefore included in those listed under the New Zealand Orchard and Garden Diseases Act, 1928.

The assumption that this Onion disease in Great Britain is the same as the American "Yellow Dwarf" rests at present on the circumstantial evidence that the symptoms are similar, so that exact identification must remain unproven until careful infection experiments can be done. KENNETH SMITH in his book on Virus Diseases (8) describes the American "Yellow Dwarf" (*Allium Virus 1*) and lists it as attacking Onions and Shallots and also the Jonquil and Chinese Sacred Lily, *Narcissus jonquilla* and *N. tazetta*. He also mentions that Lily mosaic virus (*Cucumis Virus 1*) can infect Onions, causing symptoms similar to those of "Yellow Dwarf," but the "Yellow Dwarf" virus is sap inoculable and shows the symptoms in 6-10 days, whereas *Cucumis Virus 1* is not sap inoculable and requires six weeks to show the infection.

SPREAD.

In America DRAKE, MARTIN and TATE (9) have induced no less than 75 species of aphids to feed upon Onions, all of which proved capable of transmitting "Yellow Dwarf" disease, the symptoms appearing in 7 to 12 days after infection.

The peculiar point is that similar attempts by these workers to produce the disease on Shallots gave negative results. In New Zealand, however, CHAMBERLAIN and BAYLISS (7) have transmitted the disease to Onion and Shallot by the sand abrasion method and by means of aphids. In Great Britain as yet no infection experiments are known to the writer, but in field crops several cases have been observed where yellow striping of autumn- and spring-sown Onion crops almost certainly originated from adjacent plantings of Shallots or Onion seed plants showing severe infection and from them was spreading into the young Onion crops.

SEED TRANSMISSION.

K. M. SMITH (8) notes that there is no evidence that Onion "Yellow Dwarf" is carried in the seed or in the soil. This view is supported by the following observations taken in a locality where striped foliage in Onions has been present for several years :

(a) In 1942 stripe was prevalent on a crop of Onion plants producing seed, and seedlings growing near by intended for seed production in 1943 became infected. The result was that in 1943 the seed-producing plants covering five-eighths of an acre were so badly infected that no plant could be counted entirely free from stripe and infection was noted at 100 per cent.

(b) In 1943 also the opportunity was taken of inspecting four crops of seedling Onions grown from seed of the above-described 1942 seed plants which had shown severe stripe symptoms. This inspection carried out on June 10 gave the following results :

1. In a plot of $\frac{1}{4}$ acre spring-sown (March 15) seedlings (unthinned) growing next to the above-mentioned 100 per cent. infected 1943 seed-producing plants, some 28 per cent. were showing stripe symptoms.
2. A plot of $\frac{1}{80}$ acre autumn-sown Onions (unthinned) 25 yards farther on showed 10 per cent. stripe infected plants.
3. A plot of $\frac{1}{8}$ acre spring-sown (unthinned) some 400 yards distant showed no striped plants.
4. A spring-sown crop (unthinned) about 10 miles away showed no striped plants.

As stated, the seed in all four cases was of the same variety and from the same source. It is reasonable to suppose that in the first two cases the infection had spread from the adjacent plot of severely striped 1943 seed plants so that in the spring-sown seedlings over one-quarter of the total were showing infection at the age of 12 weeks. In the last two cases there was no nearby source of infection and the seedlings remained healthy. It seems that stripe is not transmitted by the seed and that 400 yards distance was, in case No. 3, sufficient to avoid infection.

EFFECT ON SEED VIGOUR.

A small test carried out in 1944 on the seed obtained from stripe infected plants is of interest. From the above described crop of

seed-producing plants, completely infected with stripe in 1943, two plants were selected for seed. One showed severe striping both on the foliage leaves and flower stalk; the other showed faint stripes on the leaves but none on the flower stalk. The seed was harvested from each and both samples were sown at Wisley on April 1, 1944, together with a sample of seed of the same variety taken from a healthy crop in a different locality. Unfortunately, the seeds were not counted or weighed before sowing but the rate of sowing was approximately the same. The differences in germination of the different rows proved very interesting. The healthy seed came up thickly and well with 504 seedlings in a 30-foot row at 10 weeks old. The sample from the slightly striped plant yielded 384 in a 30-foot row at the same date, but the sample from the severely striped plant hardly germinated at all and at 10 weeks there were but 6 plants in the 30-foot row. These differences are accepted as indicating that the effect of stripe on Onion seed bulbs is greater than would be estimated from an inspection of the flowering plant or from the seed harvested because, as already mentioned, except in severe cases the seed stalks are not seriously stunted and the seed heads as examined on affected plants are of fair size and yield seed. It would probably need precise measurements of healthy and affected plants and careful study of the seed heads and seeds to arrive at any conclusion about the exact effect of this trouble on the formation of the seed.

OBSERVATIONS ON SHALLOTS.

Many stocks of Shallots showing striped foliage have been seen by the writer in the last five years and specimens received at the Wisley Laboratory provide evidence that this trouble is fairly widespread. It was so conspicuous in Shallots in the Vegetable Grounds at Wisley in 1940 that affected plants were marked and lifted separately for experimental purposes. In the following season (1941) there was strong evidence of the virus nature of the trouble for, after the clusters from the plants affected in 1940 had been divided, each daughter bulb on planting soon showed striping. In one test these daughter bulbs taken from plants affected the previous season were planted alternately with others taken from selected healthy stock and the result at 10 weeks old is shown in Fig. 4. The contrast in growth and vigour between the bulbs derived from healthy stock and those from striped plants was most marked from the earliest stages. At lifting time the weights, as shown in Table I, revealed the deterioration in the affected stock.

TABLE I.—*Average Weights of Shallots grown from Healthy and Stripe affected Stocks.*

Planted February 2, 1943. Lifted August 8, 1943.

	Mother Bulbs (50).	Progeny.
Healthy . .	9.8 gms.	57.0 gms.
Diseased . .	6.0 gms.	17.5 gms.

These figures support the observations of several years and there is

little doubt that the effect of stripe in Shallots is to cause a reduction in size and weight of the daughter bulbs.

IMPORTANCE ON DIFFERENT ONION CROPS.

From the available evidence it cannot be said that this disease is of serious importance on Onion crops grown for eating. In the case of autumn-sown and spring-sown Onions infection depends on the nearness of infected plants, such as Shallots or Onion seed bulbs showing the symptoms. Those young plants which become infected are undoubtedly reduced in vigour and CHAMBERLAIN and BAYLISS (7), dealing with the similar trouble in New Zealand, state the bulbs are on average reduced in size but the disposal of the crop for eating means that the virus is not perpetuated. Where the bulbs are kept for seed, however, the symptoms are quite definite in the plants in the second season. In Shallots the symptoms are usually very definite and although deterioration is marked and the bulbs get smaller, the plant is propagated vegetatively and may last for some years, during which time nearby healthy Shallots and Onions can be infected.

Discussion.—In certain parts of America it is considered necessary to carry out methods of control against Onion "Yellow Dwarf" disease. These consist of: (a) roguing out infected volunteer Onion plants, (b) producing virus free stocks of bulbs in areas free from the disease, and (c) the method known as indexing in which representative samples of sets or mother bulbs are grown in greenhouse beds or water cultures. The percentage of infected plants which appear can then be determined before the stocks are put into the ground for seed production and any highly infected stocks can be discarded.

Conclusions.—The evidence so far collected on striping of Onions in this country indicates a reduction in seed crop and a marked loss of vigour in the seed, so that the disease, although not carried in the seed, is undesirable.

There is still work to be done in exact identification and comparison with similar Onion troubles in other countries, but the facts noted here are sufficient to justify some conclusions. Watch should be kept for this trouble in Onion seed crops so that future crops can be safeguarded and young Onions intended for seed bulbs should not be grown adjacent to Shallots or Onion seed plants showing signs of stripe. It is important that crops of Shallots should be carefully watched so that striped plants can be rogued out early in the season and the stock thus kept healthy. In this connection it is worth recalling one of the methods practised in America against Onion "Yellow Dwarf" where virus-free stocks of bulbs are grown in areas free from the disease.

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BUSH AND SOFT FRUITS FOR THE PRIVATE GARDEN.

By T. E. TOMALIN.

(Lecture given on July 4, 1944; Mr. A. Cheal in the Chair.)

WHEN the Secretary persuaded me to give a talk about Soft Fruits, I asked myself whether I had anything to say about Gooseberries and Currants that has not already been said, and said much more convincingly than I could say it. I came to the conclusion that I had not, and so I decided to start at the beginning again and be quite elementary in my treatment of the subject.

This is not to say, of course, that no progress has been made during the last thirty years in the raising of new and better varieties of these fruits. Full tribute must be paid to our fruit nurserymen, and to our research stations for the success of their efforts in this direction, and also to our research chemists for the help they have given, and are giving, us in our efforts to control pests and diseases.

Nevertheless it is true that many of the old varieties commonly grown thirty years ago are still going strong. Especially is this the case with Gooseberries, of which many old favourites are still amongst the more popular varieties.

Also the old methods of cultivation have not been much altered, although certain features, such as the ornamental and useful standard specimens of Red Currant and Gooseberry common forty years ago, are seldom seen nowadays.

When considering the subject of Soft Fruits for the private garden three important points arise. First, the provision of one or two reliable varieties of each kind—bread and butter varieties—to supply bulk to the housewife for cooking and preserving. Secondly, two or three varieties of good flavour for dessert, and to interest the epicure. Thirdly, to ensure succession of fruits over as long a season as possible.

And now to take the different kinds in their order of usefulness. *The Gooseberry*, both for its long season of usefulness, from the first Gooseberry tart on Whitsunday to the last over-ripe dessert fruit in late August, as well as for the varied uses to which the berries may be put, in bottling, jam making and cooking, must surely take first place. For general purposes the varieties 'Whinham's Industry,' 'Leveller' and 'Whitesmith' will fill the bill very well indeed, and for the dessert such varieties as 'Early Sulphur,' 'Langley Gage,' 'Warrington' and the newer 'Bedford Yellow' should be tried.

But if you want to win the prize at the local show or contribute a paragraph on your giant Gooseberry to the local paper, some such varieties as 'Lancashire Lad,' 'Broom Girl,' 'Leviathan,' 'Dan's Mistake,' 'Careless' or 'Stockwell' must be planted.

Then as to the forms in which the Gooseberry may be grown. I often think that more use might be made of cordons, especially in the

small garden. They take up less room, are easy to protect, easy to prune and easy to pick from—in fact, “Gooseberries without Tears.” In this shape they may be disposed around the inside walls of the fruit cage, on fences dividing features of the garden, or on vacant spaces between the large fruit trees on the garden walls, where, in varying aspects, they will prolong the season of their usefulness. The latter point is also true of the Red Currant.

The Raspberry comes next in importance to the Gooseberry, and the confectioner would give it prior place because it provides the jam most suited for his purposes. Of varieties, ‘Lloyd George,’ if of guaranteed clean stock, is still one of the best summer fruiters, whilst its habit of providing an additional crop of “rare and refreshing fruits” on the young growths in autumn commends it to many. ‘Pyne’s Royal’ probably bears the largest berries, where the soil suits its constitution, but ‘Red Cross’ can be thoroughly recommended for it is a good grower and a heavy cropper. ‘Norfolk Giant’ is very valuable also for being a fortnight later than most in ripening its fruit.

A yellow Raspberry, such as ‘Yellow Antwerp,’ adds variety to the fruit salad and the autumn variety called ‘Hailsham-Berry’ prolongs the season until November. With this, and other autumn-fruiting Raspberries, all the old canes must be cut to the ground in February and the young growths, on the tips of which the fruits are produced, should be thinned out and supported if necessary.

Raspberries prefer a dampish situation and a soil well supplied with humus. Plantations can quickly be increased by transplanting from nearby rows surplus young suckers in May, when they are about 6 inches high. Transplant with a good ball of soil and roots, water in and spray over occasionally until established. These, if they flourish, will fruit the next season.

Black Currants, when I was a boy, were thought to be as important to the home doctor as Raspberries were to the confectioner, and it is a triumph for older generations to find modern science upholding their views, although it must be confessed that grandmother had never heard of vitamins.

For varieties ‘Boskoop Giant’ is early to ripen and bears the largest racemes and berries. ‘Seabrook’s Black,’ a good mid-season variety, is said to be resistant to big-bud, and ‘Baldwin’ is still one of the best later varieties, although ‘Daniel’s September’ is said to hang longer in good condition. Of the newer varieties ‘Mendip Cross’ raised at Long Ashton and ‘Wellington XXX’ are two which should be tried.

Black Currants tolerate a damp, heavy soil although, as the Wisley plantations show, they can be well grown on light land also, if the roots are well nourished. Their commonest pest is the mite which causes big-bud, but this can be controlled by spraying with Lime-Sulphur at 8 per cent. strength, when the young leaves are the size of a shilling.

Red Currants are indispensable in a private garden. For Red Currant Jelly of course, but also because the juice is a “setter” for Raspberry and for Cherry jam, supplying the surplus pectin which those fruits lack. Those good varieties, ‘Fay’s Prolific’ and ‘Raby Castle’ still flourish as twenty-year-old bushes in perfect health at Stansted Park, but for size of berry and of cluster, these are easily eclipsed by ‘Laxton’s Perfection,’ the perfect Red Currant for the show bench; its only fault is a tendency in the branches to break down

under the weight of crop. It calls for close pruning in its early years, and is highly recommended for cordons, or as fan-trained specimens on a fence. 'Laxton's No. 1' is the best of the newer varieties for weight of crop and for general cultivation. 'White Versailles' adds variety to the fruit salad and is quite good for dessert in times when sugar is not rationed.

Little space remains to deal with the hybrid Rubi and 'Bramble' fruits.

The Loganberry is probably the most popular of these and may be considered worth eating in April after the fruits have been bottled in syrup for eight or nine months.

The Newberry (syn. Phenomenal Berry) is a better Loganberry. Rather darker in colour, it is sweeter, better flavoured and most excellent for jam making, cooking and for dessert. Like the Loganberry, it responds well to warm or cool greenhouse cultivation, and may then be enjoyed from April onwards.

The Veitchberry is the largest of all the hybrid berries and also one of the sweetest. Although seemingly quite devoid of acid, the fruit makes excellent jam and is delicious in a fruit tart. Of strong and striking growth, its only fault is the difficulty in picking the berries, for they are neither Raspberries nor Blackberries in that respect.

Hybrid Blackberries—of these 'Bedford Giant' is probably the best early variety and 'John Innes' the best late variety, whilst the new 'Merton Thornless' will probably become the most popular with fruit pickers.

The older 'Himalaya Berry' is the strongest grower and the heaviest cropper, and although its large berries are of poor flavour, as a fruit it is popular on the market. This is essentially a subject which is useful for screening unsightly sheds or corners in a profitable manner.

For success with all these Bramble fruits, thin out young growths, where too numerous, in May, care for the young vines as they grow up, mulch heavily during the fruiting season and prune out the old vines after the crop has been cleared.

The planting of a fruit cage with soft fruits was also dealt with and an annual cleansing spray with Tar Oil standard wash at 5 per cent. strength in January recommended for all Bush Fruit. Propagation was explained by means of specimen prepared cuttings, which were shown.

SOLIDAGO.

THE Golden Rods are common enough in herbaceous borders, rather coarse-growing perennials but useful in clumps for the mass of yellow they contribute, rather than for any particular beauty in the individual flowers. Most of them come from North America, though *Solidago Virgaurea* is a native of this country. About a dozen species are in cultivation; they are more luxuriant under garden conditions than in the wild, but little has been done in the way of hybridization and selection, so that the number of "garden" forms is few; one such, *Solidago* 'Leneralis,' has been tried at Wisley recently, and has been given the Award of Merit. As can be seen from Fig. 8, it has a slender spike of erect panicles; it grows two feet high, and so is useful for the front of the border.

EARLY FLOWERING CHRYSANTHEMUMS AT WISLEY, 1944.

ONE hundred and six varieties were grown at Wisley in 1944; of these seven were grown for the first time, having been selected for trial by the Joint Committee of the Royal Horticultural Society and the National Chrysanthemum Society.

All the varieties, including the new seedlings, were given the warm water treatment as a precaution against Fielworm attack, a routine operation which we consider necessary.

The rooted cuttings taken from the treated stools, three of each variety, were planted on a fresh site on May 2, 1944. The plants were stopped once, and in spite of the unfavourable season, grew satisfactorily and flowered freely; the spray varieties were grown naturally, the others disbudded, allowing one flower to develop on each main growth.

The trial was inspected by the Joint Committee on September 13 and 28, 1944, who made their recommendations for Awards as given below.

FLOWERS WHITE.

Empire White (raised by Mr. G. M. Gibbs, Burton-on-Trent, and sent by Messrs. Johnson's (Florists), Ltd., Burton-on-Trent), **A.M.** September 28, 1944, as a disbudded variety for cutting and garden decoration.—3 feet. Flower stems $2\frac{1}{2}$ feet long. Flowers double, incurved, 5 inches diameter, white.

The following varieties have been retained for future judgment: **SUCCESS** (Vinten), **CICERO** (Woolman), **MARION** (Shoesmith).

The following variety has been deleted from the trials: **WHITE ENSIGN**.

FLOWERS YELLOW.

Golden Gem (raised by Mr. W. Avery, introduced by Mr. C. F. Kipping, and sent by Messrs. Isaac Godber, Wellington Nurseries, nr. Bedford). **F.C.C.** September 13, 1944, as a spray variety for cutting and garden decoration. Described **R.H.S. JOURNAL**, 64, 92. (**A.M.** 1938.)

Yellow Bouquet (raised and sent by Mr. H. Shoesmith, Mayford, Woking, Surrey). **A.M.** September 13, 1944, as a spray pompon variety for garden decoration.—2 feet. Flower stems 4 to 6 inches long. Flowers double, $1\frac{1}{2}$ to 2 inches diameter, Aureolin Yellow (**H.C.C.** 3).

The following varieties have been retained for future judgment: **MOSQUITO** (Shoesmith), **FLAVIUS** (Shoesmith), **IVANHOE** (Dixson).

The following varieties have been deleted from the trials: **AUTUMN GOLD**, **DIGNITY** (**A.M.** 1938), **MRS. CISSIE BIGGAM**, **WARSPITE**.

FLOWERS OF AMBER SHADES.

The following variety has been retained for future judgment: **LINDA** (Shoesmith).

The following varieties have been deleted from the trials: **ALEX McALPINE** (**A.M.** 1939), **SARACEN** (**A.M.** 1939).

FLOWERS OF PINK SHADES.

August Pink (raised and sent by Messrs. A. G. Vinten, Ltd., Oldlands Nurseries, Balcombe, Sussex). A.M. September 13, 1944, as a disbudded variety for cutting and garden decoration.—3½ feet. Flower stems 2 feet long. Flowers double, 4 inches diameter, pale Fuchsine Pink (H.C.C. 627/2).

The following variety has been retained for future judgment: **SYMPHONY** (Johnson).

The following varieties have been deleted from the trials: **MAVOURNEEN**, **YOUTH**.

FLOWERS OF ROSE SHADES.

Sweetheart (raised and sent by Messrs. J. and T. Johnson, Tibshelf, Derbys.). A.M. September 13, 1944, as a disbudded variety for cutting and garden decoration.—3 feet. Flower stems 12 to 18 inches long. Flowers double, 4½ to 5 inches diameter, light rose-pink, tips of florets amber.

Sweetness (raised and sent by Mr. H. Shoesmith, Mayford, Woking). A.M. September 28, 1944, as a disbudded variety for cutting and garden decoration.—3½ feet. Flower stems 18 to 24 inches long. Flowers double, 5 to 6 inches diameter, light rose-pink.

The following variety has been deleted from the trials: **HEATHER**.

FLOWERS OF SALMON SHADES.

The following varieties have been retained for future judgment: **DOROTHY SPEAT** (Park), **TRIXIE** (Shoesmith)

The following variety has been deleted from the trials: **WINIFRED**.

FLOWERS OF ORANGE-BRONZE SHADES.

The following variety has been retained for future judgment: **COPPER UTOPIA**, syn. **EASTMOOR RED** (Hyde).

The following varieties have been deleted from the trials: **NOMAD**, **SANDCLIFFE BRONZE**, **UTOPIA** (A.M. 1938).

FLOWERS OF BRONZE SHADES.

The following variety has been retained for future judgment: **DEEP BRONZE FREDa**, syn. **TERRA-COTTA FREDa** (Dixson, Sapsford).

The following variety has been deleted from the trials: **AJAX**.

FLOWERS OF REDDISH-BRONZE SHADES.

The following variety has been retained for future judgment: **FLAMING BEAUTY** (Shoesmith).

The following variety has been deleted from the trials: **MRS. PHIL PAGE** (H.C. 1938).

FLOWERS OF RED SHADES.

Cinnamon (raised and sent by Mr. H. Shoesmith). A.M. September 13, 1944, as a disbudded variety for cutting and garden decoration.—See R.H.S. JOURNAL, 69, 210. (A.M. 1943.)

The following variety has been deleted from the trials: **EVENING GLOW**.

FLOWERS OF CRIMSON SHADES.

Gladiator (raised and sent by Mr. H. Woolman, Sandy Hill Nurseries, Shirley, nr. Birmingham). **F.C.C.** September 28, 1944, as a disbudded variety for cutting and garden decoration.—See **R.H.S. JOURNAL**, 65, 39. (**A.M.** 1939.)

The following variety has been retained for future judgment: **HURRICANE** (Shoosmith).

The following varieties have been deleted from the trials: **CHALLENGER** (**A.M.** 1938), **INDIANA** (**A.M.** 1938), **LANCER** (**A.M.** 1940), **VALIANT** (**A.M.** 1938).

FLOWERS OF PURPLE SHADES.

Ruby (raised and sent by Messrs. J. and T. Johnson, Tibshelf, Derbys.). **F.C.C.** September 13, 1944, as a disbudded variety for cutting and garden decoration.—3 feet, of compact, bushy habit. Flower stems 12 to 18 inches long. Flowers $4\frac{1}{2}$ to 5 inches diameter, Rhodamine Purple (between H.C.C. 29/1 and 29/2) with a pale whitish-pink on the reverse of the florets.

The following variety has been deleted from the trials: **PURPLE KING**.

DAHLIAS AT WISLEY, 1944.

ONE hundred and eleven varieties of Dahlias were grown in the trials at Wisley; of these twenty-seven were grown for the first time, having been selected for trial by the Joint Committee of the Royal Horticultural Society and the National Dahlia Society in 1943, the remainder being grown for future judgment or comparison, most of which had received Awards in former years.

The Joint Committee made their recommendations for Awards on September 15, 1944, and the report records the classes to which the new varieties were assigned, the varieties retained for future judgment, and those discarded from the trials.

The National Dahlia Society did not award a Gold Medal in 1944.

LARGE INFORMAL DECORATIVE.

Enoch Potts (raised and sent by Messrs. J. Stredwick and Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** September 15, 1944.—4 feet. Flowers 7 inches diameter, Sulphur Yellow (H.C.C. 1/2); free and erect, on 12- to 16-inch stalks, above foliage.

Ethel Cottrell (raised and sent by Messrs. Brown and Such, Ltd., Maidenhead, Berks.). **H.C.** September 15, 1944.— $6\frac{1}{2}$ feet. Flowers 7 inches diameter, creamy-white; free and erect on 18- to 24-inch stalks, well above foliage.

Goldfield (raised and sent by Messrs. J. Stredwick and Son). **H.C.** September 15, 1944.— $3\frac{1}{2}$ feet. Flowers 7 to 8 inches diameter, Primrose Yellow (between H.C.C. 601/1 and 601); free and erect on 18-inch stalks, well above foliage.

Rubetone (raised and sent by Messrs. Brown and Such, Ltd.). **H.C.** September 15, 1944.—6 feet. Flowers 7 inches diameter, a brighter tone of Indian Lake (H.C.C. 826); free and erect on 24-inch stalks, well above foliage.

The following varieties have been retained for future judgment: **BEACON** (Stredwick), **MOLLY COMBE** (Stredwick), **VALIANT** (Stredwick).

MEDIUM INFORMAL DECORATIVE.

Warden Oom (raised by Bloemisterij St. Dorothea, and sent by Messrs. Derudder and Toebaert, Ghent, Belgium). **A.M.** September 15, 1944.—5 feet. Flowers 5 to 6 inches diameter, bright sulphur-yellow faintly tinged Indian Yellow (H.C.C. 6/2); very free and erect, on 8- to 12-inch stalks, well above foliage.

SMALL INFORMAL DECORATIVE.

Battle (raised and sent by Messrs. Brown and Such, Ltd.). **A.M.** September 15, 1944.—See JOURNAL R.H.S., 68, 282. (**H.C.** 1942.)

Towneley Fairy (raised and sent by Mr. J. F. Barwise, Towneley Nurseries, Boggart Bridge, Burnley, Lancs.). **H.C.** September 15, 1944.—4 feet. Flowers 3½ inches diameter, Blood Red (H.C.C. 820/1) tinged at base of florets with Cadmium Orange (H.C.C. 8); very free and erect, on 10-inch stalks, well above foliage.

The following variety has been retained for future judgment: **BRIGHTNESS** (Stredwick).

The following varieties have been discarded: **INTENSE**, **MOHAWK**, **ORANGE GLOW** (**A.M.** 1942), **RADIO**, **STOODLEY**.

MEDIUM FORMAL DECORATIVE.

The following variety has been retained for future judgment: **FIRETAIL** (Stredwick).

SMALL FORMAL DECORATIVE.

The following variety has been retained for future judgment: **KINGFISHER** (Stredwick).

SHOW.

The following variety has been retained for future judgment: **ROSETTA** (Brown and Such).

POMPON.

Leo (raised and sent by Messrs. Brown and Such, Ltd.). **H.C.** September 15, 1944.—3½ feet. Flowers 2 inches diameter, Orient Red (H.C.C. 819) on a yellow base; very free and erect, on 6- to 11-inch stalks, above foliage.

The following varieties have been retained for future judgment: **JEAN LAWRENCE** (Brown and Such), **JILL** (Brown and Such), **TOPAZ** (Stredwick).

The following variety has been discarded: **RED ALLY**.

STAR.

The following variety has been discarded: **EPSOM STAR** (**H.C.** 1932).

LARGE SEMI-CACTUS.

Boldness (raised by Messrs. Brown and Such, Ltd.). **H.C.** September 15, 1944.—4½ feet. Flowers 5 to 7 inches diameter, a rich tone of Currant Red (H.C.C. 821); free and erect, on 18- to 24-inch stalks, well above the foliage.

The following varieties have been retained for future judgment: **DOREEN WOOLMAN** (Stredwick), **N.F.S.** (Brown and Such), **NORMAN** (Stredwick), **SEARCHLIGHT** (Stredwick).

MEDIUM SEMI-CACTUS.

Trent (raised and sent by Messrs. Brown and Such, Ltd.). **A.M.** September 15, 1944.—3½ feet. Flowers 4½ inches diameter, Fire Red (H.C.C. 15/1); free and erect, on 9- to 15-inch stalks, well above foliage.

The following variety has been discarded: **SEAMEW**.

SMALL-FLOWERED SEMI-CACTUS.

Kennet (raised and sent by Messrs. Brown and Such, Ltd.). **H.C.** September 15, 1944.—4 feet. Flowers 4 inches diameter, at tips of florets Chrysanthemum Crimson (H.C.C. 824) shading to bright Blood Red (H.C.C. 820) at base; free and erect, on 9 to 14-inch stalks, above the foliage.

The following varieties have been retained for future judgment: **BRIDE** (Stredwick), **RIPPLE** (Brown and Such).

The following varieties have been discarded: **JANET LAWRENCE**, **NESTA RAMSDEN**.

CACTUS.

The following variety has been retained for future judgment: **MRS. A. HORNBY**.

BOOK REVIEWS.

"Flowers in Britain." By L. J. F. Brimble. 8vo. 393 pp. Illus. (Macmillan, 1944.) 12s. 6d.

This book, which deals with ornamental and economic plants as well as those native to the country, is intended for anyone who is interested in flowering plants. The first part deals with structure and classification and the rest of the book is devoted to descriptions of the many plant families which have representatives in this country; it is fully illustrated with drawings, photographs, and seventeen coloured plates. The style is popular but the scientific names are also given, and in many cases quotations from the poets are added. This book will appeal especially to non-botanical plant lovers.

"John Merle Coulter." By Andrew Denny Rodgers, III. 8vo. 321 pp. Illus. (Princeton University Press; in England, Sir Humphrey Milford, Oxford University Press, 1944.) 25s.

The life-time of J. M. Coulter covered an important period of development in American botanical work; the man himself was a great scientist with a charm of manner and enthusiasm that made him a leader in his generation, so that the story of his life is also that of the building up of botanical research in the United States. The author regards this book as a contribution towards a complete history of American botany and has been thorough in his investigations, using, amongst other data, some 4,500 unpublished letters; this is a worthy successor to Mr. Rodgers' life of John Torrey, published last year.

Books noted in this JOURNAL can be obtained direct from the publishers or through any bookseller; the R.H. Society's Office supplies only those books and pamphlets which have been issued by the Society.

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February 1945

THE SECRETARY'S PAGE.

The Annual Report.—The Annual Report and Accounts are published in this number. The President will address the Fellows on the occasion of the Annual Meeting on February 20, at 3 P.M. in the Lecture Room of the New Hall, and will present the awards for 1944. It is hoped that there will be a Show in the Old Hall on this occasion.

It is very desirable that the magnificent support recorded for 1944 will not only be maintained during 1945 but the Fellowship again increased, so that the Society can continue its work for the benefit of the Fellows as well as for the needs of the country.

Subscriptions and Seed Lists.—On January 1 the subscriptions to the Society fell due. It would be a great convenience if the subscriptions could be paid as soon as possible and all changes of addresses and of bankers notified at the same time, so that the card index and the addressograph plates for dispatching the JOURNAL can be kept up to date. Fellows are warned that to participate in the distribution of seeds the prepayment of the subscription is necessary.

Programme for 1945.—The programme of meetings for 1945 was published in the January issue of the JOURNAL. The first Show, as stated above, will be on the occasion of the Annual Meeting on February 20. The next Show will be on Tuesday, March 20, on which occasion Mr. R. B. Dawson will give a lecture, entitled "Our Lawns and Their Reconstruction," at 2.30 P.M. in the Lecture Room, New Hall. There will also be competitive classes for Daffodils, the Schedule of which is obtainable on application to the Secretary.

Demonstrations at Wisley.—There will be a demonstration at the Gardens at Wisley, on March 7 and 8, from 2 P.M. to 4 P.M., on "The Out-door Seed Bed and Seed Sowing." Demonstrations will also be given at Wisley, at the above times, on March 14 and 15, on "Rose

Pruning and Pruning of Shrubs," and on March 28 and 29, on "Spring Spraying of Fruit Trees." In case of bad weather a talk with lantern slides will be substituted. Fellows and their friends are asked to notify the Director, R.H.S. Gardens, Wisley, nr. Ripley, Woking, Surrey, of their intention to attend.

WISLEY IN FEBRUARY.

AFTER the cold and wet winter there is little likelihood of the precocious flowering of hardy shrubs so noticeable in the past two years; but the buds of these, as of the early bulbs, are already advanced in growth, and respond readily to any improvement in the weather, however temporary. This is nowhere more apparent than in the Alpine house, where, towards the end of the month, there will be a bright and varied show. Saxifrages form the larger part of the collection. Among the earliest are the floriferous varieties of *S. Burseriana*, usually white-flowered, like *S. scardica* and the taller *S. Schleicheri*; and plenty of colour is provided by pans of such varieties as 'Riverslea' with ruby-red flowers above dense grey cushions, 'Brenda' of pale rose, 'Bridget' with blush petals backed by red sepals, and 'Faldonside' in a pleasing combination of sulphur, red and grey. Of quite distinct habit are *S. Grisebachii*, with velvety crimson spikes, *S. Boeckeleri*, with nodding buff-yellow blooms on pink stalks, and *S. kewensis*, with arching sprays of pale rose flowers. These and many others will be in good condition for several weeks.

Small bulbous plants are indispensable at the present time; their soft-textured flowers develop more perfectly and have a longer life under glass than in the open, where they are at the mercy of the weather. Few are so popular as *Iris reticulata* and its pale blue variety 'Cantab,' which follow the larger, violet-blue *I. histrioides*. In the Wisley collection there are also *I. histrio* and its little blue variety *aintabensis*, as well as the bright yellow *I. Danfordiae*, whose continued scarcity in gardens may be accounted for by the trouble required to maintain a stock of bulbs of flowering size. Some other good things to be noted are *Eranthis Tubergenii*, a large-flowered Winter Aconite, some of the smaller Daffodils, like *Narcissus pumilus* and *N. calcicola*, and early Tulips such as *T. polychroma* and the more richly coloured *T. violacea*. The lilac stars of *Triteleia uniflora* are attractive, but the plant soon grows rather tall and untidy under glass.

On a sunny day the frames and beds near the Alpine house should be inspected. The Crocuses in flower here now include varieties of *C. chrysantha*, *C. Sieberi*, *C. biflorus* and many others; there are also some uncommon Tulips, Fritillaries and Irises, besides representatives of less well-known genera.

In the Rock garden there are few flowers yet, but welcome patches of colour are formed here and there by the blue *Hepatica angulosa*, the chestnut-feathered buds and reflexing, golden petals of *Crocus Susianus*, and *Primula Winteri* of palest lavender, sheltering beneath some of the larger rock-masses. Should the weather be favourable, a group of *Rhododendron praecox* will be covered with lovely purple blossoms for a week or two, and the larger white flowers of *R. moupinense* will begin to open in a shady corner at the east end of the Alpine meadow. Of the Snowdrops, *Galanthus plicatus* and *G. byzantinus* are

conspicuous, and the Spring Snowflakes, *Leucojum vernal* and its yellow-tipped variety *carpathicum*, are abundant in the lower and moister parts of the Rock garden.

The number of shrubs flowering in Seven Acres is increasing day by day. *Hamamelis japonica* and its varieties are at the height of their beauty. *Forsythia Giraldeana*, a variable and often pale-coloured Chinese species, is worth growing for its early flowers. The semi-double form of *Prunus Conradinae* is opening fragile pink buds, and *P. subhirtella* var. *autumnalis* has carried a sprinkling of blossom for some weeks. In the Wild garden the large old bushes of *Pieris japonica* are as usual heavily laden with white sprays. Here, too, one may find the fragrant *Daphne Mezereum*, the green-flowered *D. Laureola*, and *Corylopsis pauciflora*, forming a thicket of wiry twigs lightly but liberally hung with pleasantly scented, primrose-coloured blossom. Before the month is out drifts of golden-yellow flowers will brighten several sheltered corners where *Narcissus cyclamineus* is firmly established. The bed of "Lenten Roses" (*Helleborus orientalis*) at the lower end of the Bamboo walk is another attractive feature.

Camellias are still the most conspicuous of the many shrubs flowering in the Temperate house, and nearly all the plants noticed in our January notes are still in bloom here. In addition, there are *Pomaderris elliptica*, covered with clusters of tiny, buff-coloured blossoms above dark, evergreen foliage; *Carmichaelia Williamsii*, a Broom-like shrub from New Zealand, which bears bunches of yellow, Pea-shaped flowers on flattened branchlets; *Erica urceolaris*, carrying innumerable white flowers; *Grevillea semperflorens*, an aptly named hybrid never without feathery pink-and-yellow inflorescences; the purple-winged *Polygala myrtifolia*; and some old favourites, including *Cestrum Smithii*, *Libonia floribunda* and *Jasminum primulinum*.

GARDEN WORK.

REMINDERS FOR FEBRUARY.

Vegetable Garden.—Towards the end of the month, should soil conditions be favourable, ground which has been thoroughly dug and allowed to lie rough during the winter can be forked over in readiness for preparing as a seed bed for those crops which require to be sown early. Continue preparing ground in this manner for succeeding crops as required.

If the sites are available, prepare trenches for Celery and Runner Beans. The prepared trenches, before being required for the main crops, can be used later for successive sowings of Radishes, or for planting out quick maturing Cabbage Lettuces from the cold frame. The soil between the trenches can be prepared and cropped with successional batches of Lettuces, Dwarf Beans, early Cauliflowers, etc., in due course.

Make a sowing of Broad Beans, provided the soil is in a fit condition and, in favourable localities or positions, sow suitable varieties of Round Seeded Peas and Spinach.

Plant Shallots and Garlic on ground which has not been made too firm, allowing 12 inches between the rows and 6 to 9 inches between the cloves. Separate the small cloves of Garlic before planting, which should be covered by about 1 inch of soil.

Examine the autumn-planted Cabbage bed and fill up any existing blanks with plants from the nursery seed bed. Hoe between the plants as soon as the soil is comparatively dry, but do not apply fertilizers at this period.

Where a new bed is required, towards the end of the month is a good time to divide Rhubarb and replant on well-dug and manured ground. Early in the month select a few strong crowns of Rhubarb growing in the established bed and cover, either with pots or boxes, over which heap litterly manure mixed with leaves. The crowns of Seakale which have been planted with a view to covering where growing, should be treated in a like manner.

To retard growth, lift Parsnips and store, either in a cool shed or on the north side of a wall or fence.

Do not allow sprouts to develop on Potatoes intended for eating purposes.

Fruit Garden.—Lightly fork the ground where the cultivation of the soil between tree and bush fruits is carried out. This should be done without any root disturbance, especially in the case of shallow rooting subjects, such as Raspberries and Currants; in this instance, where soil conditions permit, the ground should be hoed in preference to digging.

Examine the stakes supporting fruit trees, renewing those necessary, and ascertain that the stakes are not chafing the bark or the ties strangling the trees. Provided the soil is reasonably dry, firm by treading all newly-planted trees and bushes, also Strawberry plants loosened by the effects of severe frost.

In those instances where the bushes of soft fruits show signs of losing vigour, an application of farmyard manure should be applied as a mulch; failing this commodity, garden compost can be substituted. In the latter instance a dressing of bonemeal, at the rate of four ounces per square yard, should be applied before putting on the compost.

All canes of newly-planted summer-fruited Raspberries should be cut down to within 6 inches of the ground, and all canes of autumn-fruited varieties, both recently planted and established ones, should be cut down to ground level. Canes of established summer-fruited Raspberries should have their unripened tips removed.

Complete the pruning and training of Peach and Nectarine trees growing on walls, also the pruning of all established fruit trees and bushes with the exception of Gooseberries and Red Currants.

Collect and burn all prunings, storing the resultant ash (which contains a certain amount of potash) in a dry place until April, when it can be applied to all the various fruit trees and bushes, giving Apples, Raspberries, Gooseberries and Red Currants first preference.

Provided the buds are quite dormant, Apple trees which it is intended to treat with a tar-oil wash, should be sprayed without delay.

Flower Garden.—In favoured districts fibrous-rooted hardy herbaceous plants can now be transplanted, provided soil conditions are suitable. It is wise to defer until late March or early April the planting of those subjects which have fleshy root systems.

● Give a top dressing of fresh soil to the Rock Garden, working it well round the necks of the plants. A compost of loam, leaf-mould and sand is suitable for many Alpines. The encrusted Saxifrages and other lime-loving plants may have lime chippings or old mortar rubble added to the compost.

Where worms are troublesome in lawns, choose favourable conditions (ground free from frost and the temperature reasonably high) to dress the surface with one of the approved powders for destroying worms. Treat the lawn in sections, covering limited areas with the powder at recommended strength and apply plenty of water immediately, using force to drive the powder into the turf. Remove the worms and, as soon as the lawn is in a reasonably dry condition, extract any large weeds with a weeding tool; afterwards periodically brush and spike the turf, but do not roll.

Late-flowering shrubs such as, *Buddleia variabilis*, *Ceanothus* 'Gloire de Versailles,' *Hydrangea paniculata*, shrubby *Hypericums* and the late-flowering *Spiraeas* can now be pruned. The pruning consists of removing all weak growths and cutting back the remaining shoots made the previous season, to within a few "eyes" of the old wood. The number of "eyes" varies according to the vigour of the individual growth and the kind of shrub.

Towards the end of the month prune and train climbing Hybrid Tea Roses.

Unheated Greenhouses and Frames.—Where fairly deep frames are available, these can be planted with Cauliflower plants raised from seeds sown the previous autumn and wintered in cold frames. Sprouted tubers of a first early variety of Potato, such as 'May Queen' can also be planted in similar frames. Choose suitable frames and, in a well-prepared compost, sow Carrot 'Amsterdam Forcing,' Lettuce 'May Queen,' Turnip 'Red or White Milan' and Radish 'Early Scarlet Globe,' or similar early maturing varieties. All the above mentioned should complete their growth in the frames.

In cold districts or where the soil conditions are unfavourable for early sowing in the open, sow direct in a cold frame, or in boxes in a cold greenhouse, seeds of Brussels Sprouts, Onions and Leeks, also early maturing varieties of Cabbages, Cauliflowers and Cabbage Lettuces, to secure sturdy plants for planting in the garden when large enough.

Immediately the seeds have germinated, encourage sturdy growth by admitting plenty of air, whenever weather conditions permit, to those vegetable seedlings which it is intended to plant in the garden at a later date. Seedlings of those vegetables intended to mature in frames can be kept a little warmer, but a certain amount of ventilation will be necessary in cases where the sun is likely to raise the temperature unduly. Admit the maximum light during the hours of daylight; protection from severe frost is necessary in both instances. As the sun gains power, water will be required by Cauliflower and Lettuce plants over-wintering in frames and every opportunity should be taken to harden these for planting out next month.

Sweet Peas sown in the autumn in pots or boxes will pay for re-potting singly in size 60 pots. Where no provision has been made for autumn-raised plants, a sowing can now be made in small pots and boxes in a cold frame or greenhouse.

Violas wintering in cold frames should be hardened off in readiness for planting in their flowering quarters towards the end of next month.

Houses containing Grape Vines need not be ventilated so freely this month. Do not admit air until the thermometer has registered 45 degrees Fahrenheit.

The buds of Peach trees grown in cold houses should now be swelling, but maximum ventilation will be advisable until the flowers begin to unfold, at which stage frost should be excluded.

FLORISTS' FLOWERS.—II.

DELPHINIUMS.

By H. S. HOTBLACK.

THE Delphinium (*Delphinium elatum*) is among the best of our border plants and deservedly one of the most popular. Varieties are available in heights suitable for the back, middle or front of the border. They can also be grown in shrubberies or on lawns. Their hardiness has been proved and they are good perennials: six or seven year old plants will send up strong spikes. The Anchusas 'Dropmore' and 'Opal' are, I think, their only real rivals in colour in the herbaceous perennial section, but the Delphinium has a far wider range, embracing nearly every shade of blue, mauve and heliotrope. There are also some excellent white varieties and also 'Pink Sensation,' although this variety should really be classed among the Belladonnas.

The origin of the type under review, *D. elatum*, is somewhat obscure. It is said to have come from Siberia and to have been introduced to this country *circa* 1600. The modern forms seen in our gardens to-day are believed to be hybrids from *D. elatum*, *D. cheilanthum* and *D. formosum*. There are about ninety different species, but only a few of them are commonly met with here, the reason being, I think, their inadaptability to our climate; most of them prefer drier conditions, at any rate in the winter. The following are, perhaps, those most frequently met with: *DD. Brunonianum, cashmirianum, cardinale, formosum, nudicaule, sinense, sulphureum, tatsienense* and *Zalil*. They range in colour through yellow, blue and red and are all perennial. *D. sulphureum* and *D. Zalil* are sometimes confused; seed purchased for the latter often turns out to be that of *D. sulphureum*—a much inferior variety. *D. Zalil*, from Syria and Afghanistan, is reputed to be bright golden-yellow and very beautiful when in flower, but, alas! is by no means easy of cultivation. These species might certainly be tried by those possessing an alpine house.

There are also the annual Delphiniums (Larkspurs). These range in colour through blue, pink, scarlet, mauve to white: they are of easy culture.

The development of the Delphinium has been going on for many years. We have only to remember the specimens that were seen in the Shows just prior to the outbreak of war, to realize such perfection could not be reached in a day. Those of my readers who can recollect the types to be seen at the Shows and in gardens forty years ago will visualize rather small, tightly compact, columnar spikes, carrying small pips of single type. Colours were not numerous and often dull. Thanks to the hybridist and to a few breaks or sports we have to-day an almost unlimited variety of types, forms, colours and combinations of colours. Early and late flowering varieties have been produced to lengthen the flowering period. Mr. JAMES KELWAY, the present JAMES KELWAY's grandfather, was one of the first to see the possibilities of the Delphinium and to specialize in it. As early as 1870 he imported French varieties, and breeding from these Messrs. KELWAY were able to offer the first batch of their own raising in the catalogue of 1882! I have seen this catalogue, which is of remarkable interest. Forty-four varieties are offered, ranging from 6s. to

18s. a dozen plants, many of them bearing French names. Some of these had, I am told, very pure colours and pips nearly as large as many we see to-day. 'Clara Stubbs,' 'Britannia' and 'June Blue' were outstanding. Mr. KELWAY tells me that some little time after this, Messrs. WALTERS of Bath brought out 'The Rev. Lascelles,' and his own firm about this time produced 'King of the Delphiniums.'

I think it must have been about this period that the real improvement in the Delphinium started. Soon after this, the Langport firm showed their well-known variety 'Smoke of War,' one of the first, if not the first, of the pyramidal type. This break from the columnar to the pyramidal type of spike has brought us many of our finest varieties. In the latter type we have the lower pips standing out on pedicels six inches or more from the stems. Many varieties, too, throw out numerous laterals which flower, in the main, after the central spike is over, thus prolonging the flowering period. They are also very useful for indoor decoration. If spikes are intended for exhibition some of these laterals (if numerous) should be taken off before they grow to any size. Messrs. BLACKMORE AND LANGDON have, for many years now, specialized in Delphiniums, for which they have gained an enviable number of awards. Over forty years ago this firm purchased some of Messrs. KELWAYS' best varieties, also some from Messrs. LEMOINE, and bred from these. I well remember the advent of that fine variety 'Millicent Blackmore,' but its colour and form were better than its constitution. Another of BLACKMORE AND LANGDON's introductions was 'Nora Ferguson,' raised by Mr. FERGUSON but introduced by BLACKMORE AND LANGDON, a strong grower, and later came their 'Lady Eleanor.' Curiously enough, this grand variety was the result of a break and not of deliberate crossing: it was a tall, pale blue with double flowers or pips and a first-class constitution and habit. 'Statuaire Rude' was another milestone in the development of the Delphinium, a mauve self which Mr. LANGDON says has played an important part in the production of large-flowered varieties. Although introduced by his firm it was raised by Mr. LEMOINE. While on the subject of breaks mention must be made of the variety 'Pink Sensation,' a pronounced novelty in colour, a chance seedling after years of work by Messrs. RUYs when endeavouring to obtain a cross with a Belladonna variety. This has, however, already been described in the Society's JOURNAL.

White and cream coloured varieties have always had their adherents. KELWAYS first introduced their improved form in 1895 with 'Beauty of Langport,' white and primrose. Some American firms have been working on these for some years. They have not become really popular here yet, but some are certainly very beautiful and improvements imparting more vigour and more substance have taken place in recent years.

Messrs. BEES are also large growers of Delphiniums and were, before the War, important exhibitors. They have certainly done their share in popularizing this flower.

The Belladonnas seem to be becoming increasingly popular. Attractive in the border or rockery, they also make good market flowers and are very valuable for indoor decoration. Here are several excellent varieties: 'Blue Bees,' 'Capri,' 'Isis,' 'Naples,' 'Orion,' 'Wendy'—all in shades of blue. There is also a much branched white—'Moerheimi.' They will grow to about three feet, and are good perennials and perfectly hardy. 'Pink Sensation,' already

referred to, should be classed with these. They require no special cultivation.

The cultivation of *D. elatum* presents no difficulties, but it responds well to good conditions and a little extra attention. Given these and the right varieties, Delphiniums can be had in bloom from the middle of June until the end of September. They will do well in any average soil. To obtain exhibition spikes, a good depth of soil will be necessary and a position where they can obtain plenty of sunlight. Sufficient room for proper development is required. The soil should be dug two feet deep and the plants should be not less than two feet apart. This ensures the presence of sufficient light and air round the plants. Good plants can, however, be grown in the border under less ideal conditions. Rotted farmyard manure or garden compost should be mixed with the soil, whether it be light or heavy—the lighter the soil, the more humus should be present. Heavy soil should have straw manure or some medium which contains a good proportion of fibrous matter mixed with it. Leaf mould is most beneficial, helping to keep the soil open and porous. Wood ash is another good adjunct. On non-chalky soils, hydrated or slaked lime must be added, especially if artificial manures are used—a thorough dusting once every two years should be sufficient, although some growers consider that lime should be applied every year. A judicious use of artificial manures generally shows good results, but it is difficult to lay down any hard and fast rule about these; so much depends on the physical and organic composition of the soil and on its calcium content. Basic slag, difficult to obtain in war-time, is a good, slow-acting, phosphatic manure. It should be applied in November at about four ounces per square yard. This can be used on heavy soils where superphosphate is not recommended as it tends to coagulate them. "Super" can be applied to light soils, preferably in the early spring, at about three ounces per square yard. Bone meal or bone flour can be added also (or instead) in the spring at about four ounces to the square yard. The soluble (readily soluble) types can be used in liquid form while the plants are developing.

As well as these artificial manures, soot water mixed to the colour of rather weak coffee can be used with advantage. Also, of course, there are several well-known proprietary fertilizers on the market, most of which contain the three main feeding elements, i.e. nitrate, phosphate and potash. When using these highly soluble salts it is safer to use them in weak solution. Nitrate of soda should not be used in a stronger solution than one half ounce per gallon. Soluble phosphates, muriate of potash and sulphate of potash, can be applied up to one ounce per gallon. The proprietary brands generally bear on the bag or container instructions as to the best dilution to use. Care should be taken not to feed with these soluble salts in wet weather, otherwise much of their value will be washed away. In very dry weather a good soaking of plain water before applying is advisable.

When the shoots are a few inches high in spring, it is advisable to thin them out, retaining only the stronger ones. For exhibition, some growers retain only two or even one spike. Mr. FRANK BISHOP of Windsor, one of the most, if not the most, successful of amateur exhibitors, allows only one or two spikes to develop, according to the vigour of the plant. This is, perhaps, rather drastic, especially if it is intended to keep the plant for another year or so, but a few good

spikes are far better than a crowd of small ones. He seldom keeps plants after the first year of flowering: any kept for the second year are allowed three spikes. This treatment is for exhibition plants only, border plants being allowed from four to six stems. His average percentage of rooted cuttings is as high as 95 %.

In most gardens strong winds in June and July (these seem to be more prevalent now than formerly) will do considerable damage. Staking in some form is therefore necessary. Clumps in the border can be supported effectively by using Dahlia stakes; three or four driven in around the clump with two or three strands of fillis string tied round them will be all that is necessary, but it must be done early, when the shoots are about eighteen inches high. Placed in good time, the stakes will hardly be seen as the plants develop. Growers for exhibition generally use strong canes, which should be pushed firmly into the ground. The height of the canes will depend, of course, on the height of the plant. The stems should be tied firmly to these, but loosely enough to allow for the natural swelling as the plants develop.

A good mulching is generally necessary in May or June. It should be applied before the soil becomes dry. This not only saves much watering in dry weather but prevents the surface, especially on heavy soils, from becoming caked after rain or watering and from cracking in dry weather. Mulching helps considerably in keeping the soil moist while the plants are developing. Various materials can be used, often depending upon what the grower happens to possess in sufficient quantity—manure, leaf-mould, compost or old rotted long grass, not grass mowings, which mat together and exclude air. Hay taken from an old stack, no longer fit to feed to animals, is excellent.

After flowering it is advisable to cut off the old flower spikes to prevent them making seed, except in cases where seed is required. The carrying of a large crop of seed tends to exhaust the plant. The old stems should not be cut down until the leaves change colour.

Insect pests are, generally speaking, not very troublesome. The larvæ of the Golden Eight Moth, *Plusia moneta*, can do considerable damage if not checked in time. The moth is said to appear in the late summer, in which case I can only presume the eggs are laid in the soil, and hatch in the spring, when the young larvæ crawl up the stems until they reach the young leaves and flower buds at the top. They are difficult to detect when small, but it is then that the damage is done. Constant watch must be kept, and I consider hand-picking the best remedy, although I believe applications of nicotine dust are effective. The only other real pest is the slug, as many growers on heavy soils know to their cost. Several species seem to be involved. The most dangerous time is in the early spring, February and March, when they will eat a hole in the young shoots just below the surface of the soil. This "underground warfare is most unfair" because, short of scraping away the soil round the plants, it cannot be detected. If not destroyed, the slugs will continue to damage the shoots until they become hard. There are several good slug destroyers on the market and home-made traps can be very effective. Powdered "Meta" mixed with bran is decidedly efficacious. A simple method of catching slugs is to place the skin of half an orange (when oranges are obtainable!) near the plant, but these must be examined every morning and the pests collected. All substances for destroying or collecting should be placed under a small piece of tile or flat stone.

~~The~~ will prevent them being washed away by rain or dried up by the sun's rays. One of the best ways, although very laborious, is to examine the plants on damp evenings with a torch and a jar containing a strong saline mixture. I have caught several hundred in a night in this way. Mr. MACSELF recommends paradichlorbenzine, broken down to a rough powder; a salt-spoonful to be placed in a hole three or four inches deep every yard round the plants, the hole to be closed and left. One application will be sufficient for four or five months.

Delphiniums are not very subject to disease, there being only two that the grower need be seriously concerned about. Black Root Rot is the most serious and generally seems to cause the death of the plant attacked. Mr. D. E. GREEN has been investigating this disease at Wisley. He tells me that he has not been able to find any fungus in connection with it. He has, however, discovered several kinds of bacteria, but on inoculating healthy plants with these, has never succeeded in reproducing the typical Root Rot condition. Young healthy plants do not often appear to be attacked, but mostly old plants or those growing in uncongenial conditions. Mildew is not, as a rule, serious in Delphiniums. In some seasons it gives very little trouble and does not usually appear until the flowering spikes are over. Much can be done to mitigate its ravages. Allow plenty of room between the plants so that they get a good circulation of air round them. Dusting of flowers of sulphur, preferably after dew, will keep it in check. Mr. LANGDON says that the mildew-resisting varieties have smooth leaves and deduces from this that moisture on the leaves, taking a longer time to dry off, is the cause of mildew. All Delphiniums are not subject to it, there being several immune varieties, and growers are now breeding to this end.

There are three ways of propagation: by division of the roots, by cuttings and by seed. When division is practised this should be done in the early autumn, care being taken not to damage too many of the dormant buds. If this work is carried out in September the resulting pieces will have a chance to get established before the winter months curtail the action of the root. Division, or breaking up the root-stock, is not, however, recommended, as Delphiniums seem to resent such root disturbance. Taking cuttings is the usual method employed; by this means true stock is obtained. Cuttings, if taken in February or March—the best time—will flower about August, thus prolonging the flowering season. They should be taken from two to four inches long, selecting short, sturdy shoots. This is not always an easy task when the plants are too deep in the soil, as the cut must be made with a sharp knife just where the shoot joins the root stock. Hollow stemmed cuttings are useless. Cuttings when taken can be struck in pots, boxes or a cold frame, using a light compost of fibrous loam and sand—a little fine peat or leaf mould can be added. A light covering of leaf mould or sand on the surface will help aeration. The soil should be thoroughly moistened before the cuttings are inserted; after this they should require little watering. They must be kept closed (presuming they are in a cold frame) for several days. As they become rooted air will be necessary, but direct sunlight must be avoided or they will suffer from undue evaporation. When growth becomes apparent they can be gradually hardened off. When planted out in their permanent quarters, generally about May, it is essential that they do not lack moisture before they get established.

Delphiniums do not come true from seed, on account of their hybrid

ROYAL HORTICULTURAL SOCIETY

ESTABLISHED 1804.

INCORPORATED 1809.

NOTICE IS HEREBY GIVEN that the ONE HUNDRED AND FORTY-FIRST ANNUAL MEETING of the Fellows of the Society will be held in the LECTURE ROOM, NEW HALL, GREYCOAT STREET, WESTMINSTER, on Tuesday, February 20, 1945, at 3 P.M. precisely, for the purpose of receiving the Report of the Council for the past year, and electing a President, Vice-Presidents, Treasurer, Three Members of Council, and Auditor for the ensuing year.

By Order of the Council,
F. R. DURHAM,
Secretary.

ROYAL HORTICULTURAL HALL,
VINCENT SQUARE, WESTMINSTER, S.W. 1.
January 31, 1945.

ANNUAL MEETING

To be held at 3 P.M., February 20, 1945

AGENDA

Minutes of the last Annual Meeting, held February 15, 1944.
Report of the Council.
President's Address.
Treasurer's Statement.
Election of President.
Election of Vice-Presidents.
Election of Three Members of Council.
Election of Treasurer.
Election of Auditor.
Presentation of the Victoria Medal of Honour.
Presentation of Associate of Honour Badges.
Presentation of the Veitch Memorial Medals.

[P.T.O.]

LIST OF NOMINATIONS

The following list of nominations of President, Vice-Presidents, Members of the Council and Officers for election is circulated in accordance with By-law 58 :

	<i>Proposed by</i>	<i>Seconded by</i>
<i>As President :</i>		
LORD ABERCONWAY, C.B.E., V.M.H.	Mr. E. A. Bowles.	Mr. R. D. Trotter.

<i>As Vice-Presidents :</i>		
General His HIGHNESS MAHARAJA SIR JOODHA SHUMSHERE JUNG BAHADUR RANA, G.C.B., G.C.S.I., G.C.I.E. Lieut.-General His HIGHNESS THE MAHARAJA OF JAMMU AND KASH- MIR, G.C.S.I., G.C.I.E., K.C.V.O. Field Marshal THE RT. HON. JAN C. SMUTS, P.C., C.H., F.R.S., K.C. THE VISCOUNT ULLSWATER, G.C.B., P.C. Professor L. H. BAILEY, LL.D., Litt.D. Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H. Mr. ALISTER CLARK. Mr. F. CLEVELAND MORGAN. SIR FREDERICK MOORE, M.A., D.Sc., F.L.S., V.M.H. Mr. B. Y. MORRISON. Mr. C. T. MUSGRAVE, V.M.H. Mr. C. G. A. NIX, V.M.H. Colonel THE HON. SIR HEATON RHODES, K.C.V.O., K.B.E. SIR WILLIAM WRIGHT SMITH, M.A., F.R.S.E., F.L.S., V.M.H.	}	Lord Aberconway. Col. F. C. Stern.

<i>As Members of Council :</i>		
THE DUKE OF DEVONSHIRE, K.G. .	Mr. J. B. Stevenson.	Mr. A. Cheal.
THE HON. DAVID BOWES-LYON. .	Mr. G. W. Leak.	The Hon. Lewis Palmer.
Mr. F. A. SECRETT, F.L.S., V.M.H.	Dr. R. G. Hatton.	Col. F. C. Stern.

<i>As Treasurer :</i>		
Mr. R. D. TROTTER	Dr. H. V. Taylor.	Dr. E. J. Salisbury.

<i>As Auditor :</i>		
Mr. F. G. FEATHER, F.C.A. . .	Mr. W. R. Oldham.	Mr. T. Hay.

By Order of the Council,
F. R. DURHAM,
Secretary.

December 30, 1944.

REPORT OF THE COUNCIL

Figures up to and including November, 1944.

LOSS BY DEATH IN 1944.			ELECTIONS IN 1944.		
Honorary Fellows	..	I	Life Fellows	..	32
Associates of Honour	..	3	4 Guinea Fellows..	..	18
Life Fellows	..	26	2 „ „	..	517
4 Guinea Fellows	..	4	I „ „	..	1,274
2 „ „	..	159	Associates	..	105
I „ „	..	201	Affiliated Societies	..	58
Associates	..	2			
		<hr/> 396			<hr/> 2,004

LOSS BY RESIGNATION.		SUMMARY FOR 1944.
4 Guinea Fellows ..	9	Elections 2,004
2 " " ..	192	Resignations and Deaths .. 975
1 " " ..	439	<u> </u>
Associates ..	40	NET INCREASE .. 1,029
Affiliated Societies ..	46	
	<u>726</u>	
Less reinstated ..	147	
	<u>579</u>	

Total on November 8, 1943	..	..	25,080
Total on November, 1944	..	..	26,109

The programme of meetings provisionally arranged for the year 1944 could not be carried out in full. Two of the meetings, one at the end of July and one in September, were cancelled in view of enemy action. The other Monthly Meetings and Shows were well supported with exhibits from amateurs and the trade and by the attendance of the Fellows and the public. The competitions were keenly contested. The Affiliated Societies again came forward to co-operate with the

ii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Society and held their competitive classes on dates suited to their particular type of flower. This co-operation is much appreciated. The lectures were well attended and have been reported in the Society's JOURNAL.

Programme for 1945.—With the prospect of an improved situation a larger programme has been arranged for 1945. It is hoped, circumstances permitting, to hold a Show on the occasion of the Annual Meeting fixed for Tuesday, February 20, and it is proposed to hold one Show in March and one in April, at both of which there will be competitive classes for Daffodils. There will be three Shows in May, of which that on May 29, 30 and 31 will be a special three-day Show to be held in the Society's halls as a modest restart of the Great Spring Show of the Society. The Council has, to its great regret, been advised that, with the lack of exhibition ground material, such as tents, and the depletion of nurserymen's stocks, the holding of a Show at Chelsea in 1945 is impossible. Further Shows will be held in June, July, September and October. The dates, etc., are given on the tickets and passes and further particulars will appear in the JOURNAL and the Press.

The other services of the Society directed from its offices in London—the Library, advisory services, publications, examinations, lectures, etc.—will be carried on as usual.

Reinstatement of Medals and Cup.—In 1945 the following two medals and cup (shortly described) will again be offered for competition:—The Sander Medal, for the best new greenhouse plant of general utility shown during the year; the George Moore Medal, for the best new *Cypripedium* shown during the year, and the Reginald Cory Memorial Cup, for the best hardy hybrid of garden origin shown during the year. Further particulars with regard to these medals and cup will be given elsewhere in the JOURNAL in due course.

Food Production.—Food production has up to now been one of the main considerations that have directed the activities of the Society and it will continue to be of national importance, more especially the work which has been done in the past in co-operation with the Ministry of Agriculture must be carried on. Special reference to this work is given in the appropriate paragraphs in this report.

The Society's panel of lecturers has been well employed; the photographic exhibition of vegetable growing has retained its popularity and has been especially welcomed in the schools by the County education authorities. The use of the library of slides dealing with fruit and vegetable production has at times been stretched to its limit.

The Knightian Medal for the best cultivated plot has been keenly competed for by the affiliated horticultural and allotment societies.

Horticultural Courses.—Horticultural Courses arranged in 1943–1944 especially for the Women's Land Army at the request of the Ministry of Agriculture were well patronized. For the course "Vegetables grown in the Open" there were 336 entries and 255 certificates were issued; for "Fruit grown in the Open" 122 entries, and 94 certificates, and for "Crops grown under Glass" 160 entries, and 121 certificates. A body of 37 tutors conducted the courses. Similar courses have commenced for the session 1944–1945.

The Council wishes to express its gratitude to the professional horticulturists who acted as tutors. Their reports were full of appreciation of the work of the pupils.

REPORT OF THE COUNCIL.

Greenhouse Plants.—The question of fuel supplies for the preservation of plants of national importance continues to be dealt with by the Committee set up by the Society at the request of the Ministry of Fuel and Power with the support of the Ministry of Agriculture.

Wisley : The Garden.—Owing to the drought experienced through the spring and summer the garden has not shown the usual luxuriant growth and considerable difficulty has been experienced in supplying sufficient water even to recently established plants.

Further planting of Battleston Hill has been impossible owing to labour shortage. The plants already established have, however, grown well and a good flowering season may be expected in 1945.

The field west of Battleston Hill was again devoted to the cultivation of Lettuce and Dwarf French Beans for seed purposes, while certain portions of the garden ordinarily used for the Floral Trials were devoted to the growing for trial of Onions, Sweet Corn and Leeks.

Severe late spring frosts on two successive nights occurred in May on the 7th and 8th, when 17° and 16° of frost were registered. This proved disastrous to vegetation already started into growth and destroyed the blossom of practically all fruit on the Trial Ground.

As in 1943 the standard Floral Trials included Bearded Iris, Border Carnations, Early-flowering Chrysanthemums and Dahlias. During the season a fresh plantation of Delphiniums has been completed.

The Society's invited trials from home-produced vegetable seed comprised Carrots, Onions and late heading Broccoli. Demonstration Trials of Kale and Sprouting Broccoli were also grown.

During the year seeds of 740 varieties of vegetables from Lease-Lend sources were received and grown at Wisley, including samples direct from Cyprus, Malta, Palestine, India, Ceylon and Portugal. This showed an increase over the number of stocks received in 1943. These Trials were inspected during the summer by members of the wholesale and retail seed trade, National Farmers Union and market growers.

Further new varieties have been added to the National Trials of Hardy Fruits for commercial purposes and additional varieties have been planted in the standard collections.

New trial plots of Raspberries and Black Currants have been established. Promising new varieties have been propagated for the sub-stations for extended trial.

Twelve demonstrations on the practical work of the garden were carried out during the year, the subjects referring specially to the cultivation of vegetables, flowers and fruit.

School of Horticulture and Educational Work.—(a) The courses of instruction have been maintained for the younger gardeners at Wisley.

(b) During the year the Society's practical examinations for the National and Teachers' Diplomas were carried out at Wisley. It was gratifying to note that the interest in these examinations, as shown by the number of candidates, was well maintained in spite of war conditions.

(c) The Society has offered, temporarily, laboratory accommodation and teaching facilities at Wisley to the staff and students of the Swanley Horticultural College whose premises were destroyed by enemy action.

(d) Two parties of R.A.F. personnel attended lectures and demonstrations at Wisley.

Food Production and Advisory Services.—The Advisory Services of the laboratory staff have again been chiefly concerned with food production in its various aspects—with analyses of soils and with the control of plant pests and diseases of fruit and vegetables. Co-operation with Allotment Societies has been a prominent feature of the advisory work and the Entomologist and Mycologist have regularly throughout the season visited allotments in the London area. Other members have continued their services to the County Garden Produce Committee and the Central Garden Produce Committee for whom visits have been paid and lectures given to stimulate the formation of Produce Associations. The annual meeting of the Surrey County Garden Produce Committee was held at Wisley.

Investigations. 1. Physiology.—(a) A third season's investigations have been carried out on onion sets and the Society records with appreciation the co-operation of those County Officers from the south of England to the north of Scotland who have assisted by making trials of onion sets in their own districts.

(b) The small scale investigation on the growth of flax under greenhouse conditions, undertaken at the request of the Ministry of Supply, has been continued and it is likely that this work will be concluded in the spring.

(c) Experiments on propagation are being continued.

2. Entomology.—Entomological research was carried out during the year on :

(a) The effect of dates of sowing and the use of poison bait on the incidence of Carrot Fly.

(b) The effect of various concentrations of Tar Distillate washes on the eggs of the Bean Aphis on garden forms of *Euonymus* (Spindle).

(c) The distribution of three continental species of insects, namely, the Lily Beetle, the Yew Scale and the *Laurus-tinus* White Fly.

(d) The effect upon various horticultural and domestic pests of D.D.T. liquid and powder.

(e) The effect of subjecting Chrysanthemum stools to the Warm-water treatment at different periods of the year.

3. Mycology.

(a) The tests of *Antirrhinum* stocks resistant to Rust disease are being carried on.

(b) Experiments are being continued to ascertain how often and at what times spray should be applied against Blight disease on outdoor Tomatoes.

(c) Work on Neck Rot and Virus disease in Onions and Shallots is in progress.

Staff.—It is with regret that there must be recorded the death of the Society's Assistant Mycologist, Dr. Dorothy Ashworth, who had served the Society for a period of 9½ years. Dr. Ashworth was a leading research worker and at the time of her death was doing a special investigation of the relation of rusts on *Berberis* to wheat production.

White Fly Parasite.—The White Fly Parasite was again distributed during the year, but the demand during the earlier months of the year invariably exceeds the supply.

Library and Herbarium.—The working library and herbarium have been maintained, and amongst interesting additions are the acquisition of certain floras of Europe and America, and Entomological Journals.

Red Cross.—The Society has continued to support the Red Cross effort to supply seeds to our men who are prisoners of war. The particulars of the supply of seeds and copies of letters of grateful appreciation from prisoners of war have been published from time to time in the Society's JOURNAL and have appeared in the general Press. In all the staff has packed some 979 parcels which have been despatched to the camps since the commencement of the service in 1941. The Society is grateful to the seed firms who have generously contributed seeds and for the co-operation that it has received from the Dominions as well as from Fellows and friends at home. This service is being still carried on and will be continued as long as circumstances permit or require it.

Horticultural examinations have been held for our men in various prisoner of war camps and 34 candidates have sat, of whom 25 have been successful in obtaining their certificates. Arrangements for 1945 have been put in hand.

The Lindley Library.—The Library has been much used throughout the year and the loan service maintains its popularity with the Fellows.

Examinations.—1,094 entries were received and certificates were awarded to 331 senior and 177 junior candidates in the General Examination. In the Teachers' Preliminary Examination 150 candidates were successful and in the Advanced, 16. The National Diploma in Horticulture has been granted to 15 candidates and 24 candidates passed the Preliminary Examination. The examinations will again be held in 1945.

Publications.—The sixth and seventh impressions of "The Vegetable Garden Displayed" have been issued, making a total issue of over 300,000 copies, and the demand for this popular publication is still maintained. Progress continues to be made with the Society's Dictionary of Gardening, and the Study of the *Genus Paeonia* is now ready for issue when circumstances permit. Several of the lectures and articles in the JOURNAL have been re-issued in pamphlet form, such as "An Amateur's Fruit Garden," "Hedges and Screens," "Alpine Plants for the Small Garden," and "The Amateur's Shrub Garden," as it was thought that pamphlets of this nature would be of general service to the Fellows and the public in the rehabilitation of their gardens. Curtis's Botanical Magazine continues to be issued.

Obituary.—The loss of many distinguished horticulturists has to be regretted. Among them may be recorded Lt.-Col. Sir David Prain, V.M.H., a Vice-President of the Society; Sir John Farmer, Mr. P. R. Barr, Mr. E. L. Hillier and Mr. F. W. Millard, also holders of the Victoria Medal of Honour, and Associates of Honour, Mr. J. W. Besant and Miss Mary Burton. In addition, mention should be made of Major J. M. FitzGerald, an amateur grower of border carnations; Dame Alice Godman, a keen horticulturist and exhibitor; the Rev. Prof. E. S. Lyttel, an expert on lilies and many other plants; Lady Beatrix Stanley, an enthusiastic amateur gardener and artist; Mr. T. Armstrong of Messrs. Armstrong & Brown; Mr. Spencer W. Mount, Chairman of the Society's National Fruit Trials Committee, Mr. A. W. White of J. T. White & Sons, Ltd., who took a leading part in the

development of the bulb growing industry in this country, and Mr. A. J. Wood, a leading exhibitor and member of the Shows Committee.

The Victoria Medal of Honour.—The Victoria Medal of Honour has been awarded to Mr. W. D. Besant for his services to horticulture, especially as Director of the Glasgow Parks and Botanic Gardens ; to Mr. M. B. Crane for his work on fruit cultivation and on the genetics and origin of garden plants ; to Dr. J. Hutchinson for his work on systematic botany and for horticulture generally, and to Mr. W. E. Th. Ingwersen for his wide knowledge of plants and his work in collecting new and rare species.

Associates of Honour.—The Associateship of Honour has been awarded to Mr. H. H. Cook of the University Horticultural Station, Shinfield, Reading, and to Mr. J. Hope, head gardener to the late Mr. A. K. Bulley at Ness, Neston, Wirral, Cheshire.

The Veitch Memorial Medals.—Awards have been made as follows : a Gold Medal to Col. Stephenson R. Clarke for his work for horticulture ; a Gold Medal to Mr. Wm. H. Judd for his work in the Arnold Arboretum, and a Gold Medal to Dr. J. Ramsbottom for his work on edible and other fungi.

Gifts to the Society.—The Council desires to express the Society's thanks to its friends and Fellows for gifts of plants and seeds and especially for valuable contributions to the Library, and also to Lady Buchanan for the gift of some 200 watercolours of Indian plants painted by her mother Lady Beatrix Stanley and for the bequest of botanical, horticultural and scientific books of Mr. P. R. Barr.

Council.—The Council desires to record its thanks to its three retiring Members, Mr. A. Cheal, Mr. J. B. Stevenson and Dr. H. V. Taylor, for the most valuable services that they have rendered. It is a matter of gratification to know that their advice will still be available on the many committees of which they are members.

The Press.—The Council desires to record its appreciation of the help and support so freely and so ably given to the Society by the Press.

Committees, Judges and Examiners.—The Council is deeply grateful to the members of the Society's various committees as well as to the judges and the examiners, all of whom have so generously contributed to the success of the Society by the work that they have carried out in spite of difficult war conditions.

Staff.—The Council desires to express to the Secretary and his staff at Vincent Square and to the Director and his staff at Wisley its appreciation of their work so loyally carried out in the face of every difficulty.

Signed on behalf of the Council,
ABERCONWAY,
President.

December 30, 1944.

ROYAL HORTICULTURAL SOCIETY—TRUST FUND ACCOUNTS, 31st DECEMBER, 1944

	Amount of Fund represented by Investments at Cost.		Income Balance in hand 31st Dec., 1943.		Income received during 1944.		Expenditure in 1944 in accordance with the Trust.		Income Balance in hands of R.H.S. 31st Dec., 1944.		
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	
1. ALFRED DAVIS TRUST FUND	1,049	9 2	39	13 7	43	1 8	nil	(f)	48	11 4	(a) Investment
2. WILLIAMS MEMORIAL FUND	258	15 4	172	16 2	20	0 0	nil	(f)	192	16 2	Cost of books purchased by the Society up to 31st Dec., 1943.
3. MASTERS MEMORIAL FUND	542	17 0	nil	nil	5	4 0	5	4 0	nil	nil	Books purchased by the Society in 1944.
4. NICHOLSON MEMORIAL FUND	202	2 2	6	6 8	20	0 0	20	0 0	6	6 8	(b) Balance of Cory Bequest at 31st Dec., 1943.
5. SCHRÖDER PENSION FUND	557	14 6	15,747	1 9 (a)	350	6 11 (c)	350	6 11	nil	nil	Add Interest received and added to Fund
6. LINDLEY LIBRARY TRUST FUND	1,574	1 9	148	7 3	25	3 0	nil	(f)	173	10 3	Further Sales
7. SIR JAMES KNOTT TRUST	600	0 0	1,742	0 11	44	4 4	24	15 0	85	9 2	Less books purchased in 1944
8. VEITCH MEMORIAL TRUST FUND	1,742	0 11	31	4 11	7	16 6	nil	(f)	39	1 5	Balance at 31st Dec., 1944
9. MOORE MEDAL TRUST	190	10 6	89	0 4	18	2 2	nil	(f)	107	2 6	(c) Includes contribution by the Society in 1944.
10. SEWELL MEDAL TRUST FUND	532	14 4	65	13 2	7	12 10	nil	(e)	73	6 0	Society in 1944. £303 ros. 3d.
11. MRS. SHERMAN HOYT PRIZE FUND	208	1 2	4	7 4	5	19 0	9	16 0	10	4	(d) Income added to Fund and re-invested.
12. LORD RIDDELL TROPHY FUND	222	12 11	264	14 2	7	19 9	7	19 9 (d)	nil	nil	(e) The trophies awarded for 1942 and 1943 have not yet been purchased. No award was made in 1944.
13. DEDICATIONS VOLUME FUND (Botanical Magazine)	1,424	16 0	45	16 10	37	11 0	37	11 0 (d)	nil	nil	(f) Not awarded during year.
14. THE COLMAN FUND	372	7 9	100	0 0	10	19 5	6	10 6	50	5 9	2. Raised by donations in 1891 in memory of the late Mr. B. S. Williams towards the provision of one or more annual lectures.
15. P. D. WILLIAMS FUND	100	0 0	19	0 10	3	6 3	nil	nil	22	7 1	3. Raised by donations in memory of the late Baron Schröder to pay to the Cardenian Royal Bevoelent Institution for one year the salary of the late Sir James Knott for the purpose of the purchase of books by the Society in 1922.
16. THE GLAZEBROOK FUND	746	5 3 (b)	nil	nil	12	12 5	12	12 5	nil	nil	4. Presented to the Society in 1922. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
17. CORY BEQUEST TO LINDLEY LIBRARY											5. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.

Notes on above Funds:

1. Bequeathed to the Society in 1870 for annual prizes or any other object the Council may determine.
2. Raised by donations in 1891 in memory of the late Mr. B. S. Williams towards the provision of one or more annual lectures.
3. Raised by donations in memory of the late Baron Schröder to pay to the Cardenian Royal Bevoelent Institution for one year the salary of the late Sir James Knott for the purpose of the purchase of books by the Society in 1922.
4. Presented to the Society in 1922. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
5. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
6. The nucleus of the library is the fine collection of books and pamphlets which belong to the late Mr. R. D. Williams and 700 of them were presented to the Society in 1928 by the late Mr. R. D. Williams.
7. Presented to the Society in 1920 by the late Sir James Knott for the purpose of the purchase of books by the Society in 1922.
8. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
9. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
10. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
11. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
12. Presented to the Society in 1928 by the late Mr. A. J. Sewall to provide medals for Rock Garden plants.
13. Proceeds of the sale of Curtis's Botanical Magazine Dedications, 1897-1927, presented in 1928 to the Society by the late Mr. R. D. Williams.
14. Bequeathed to the Society in 1928 by the late Mr. R. D. Williams.
15. Bequeathed to the Society in 1928 by the late Mr. R. D. Williams.
16. Bequeathed to the Society in 1928 by the late Mr. R. D. Williams.
17. Proceeds of the sale of duplicate books being part of the bequest of the late Mr. Reginald Cory to the Lindley Library (referred to under No. 6), held, for the time being, in trust by the Society for the purchase of further books.

Dr.

ANNUAL REVENUE & EXPENDITURE ACCOUNT

1943	To LONDON—	£	s.	d.	£	s.	d.
£	ESTABLISHMENT EXPENSES LESS ALLOCATIONS—						
8,204	Rent, Rates and Taxes		2,647	19	11		
8,211	Salaries and Wages		8,361	15	5		
	Other Establishment Expenses, including						
	Light, Fuel, Stationery, Professional Fees,						
	and Renewals		3,121	16	9		
3,621							
14,036					14,131	12	1
	„ WISLEY—						
	Net Expenditure for Year, as per separate						
11,293	Account				15,935	0	3
	„ PRINTING AND POSTAGE OF JOURNAL AND OTHER						
11,019	PUBLICATIONS		10,629	4	9		
6,295	Less Sales and Advertisements		4,757	19	2		
4,724					5,871	5	7
1,080	„ STAFF PENSIONS		1,080	6	0		
509	Less Contributions by Staff as per Scheme		435	3	9		
571					645	2	3
	„ MEETINGS—						
	Expenses, Labour and Overheads of Special						
	and other Meetings		1,561	18	7		
1,556	Less Receipts		144	3	10		
105					1,417	14	9
1,451							
18	„ CUPS AND MEDALS				83	14	3
	„ GARDEN INSPECTIONS—						
18	Expenditure less Receipts				11	13	1
	„ CONTRIBUTIONS TO LINDLEY LIBRARY, as per						
	Trust Account—						
91	Purchase of Books		84	9	7		
362	Salaries, etc.		303	10	3		
453					387	19	10
	„ SPECIAL EXPENDITURE—						
	Donation, Gardeners' Royal Benevolent Inst.		52	10	0		
	„ Royal Gardeners' Orphan Fund		21	0	0		
	„ London Children's Gardens		10	10	0		
	„ British Colour Council		5	5	0		
	„ Royal Geographical Society		10	0	0		
	„ Women's Farm and Garden Assn.		52	10	0		
	„ Red Cross Agricultural Fund		105	0	0		
	Contribution to the Sir William Wright						
	Smith Portrait Fund		21	0	0		
157					277	15	0
154	„ BOTANICAL MAGAZINE		234	3	4		
141	Add Work in Advance		370	0	0		
295					604	3	4
	„ EXAMINATIONS IN HORTICULTURE—						
581	Expenses		731	10	1		
547	Less Fees		692	8	8		
34					39	1	5
-	„ GENERAL SCHOLARSHIPS (not awarded)				-	-	-
	„ OLD AND NEW HALLS SINKING FUND APPROPRIATION				3,366	0	0
3,366							
	„ RESTAURANTS—						
379	Proportion of Overhead Expenses				466	14	5
	„ Balance being Excess of Revenue over Expenditure						
	added to General Reserve				-	-	-
507							
£37,302					£43,237	16	3

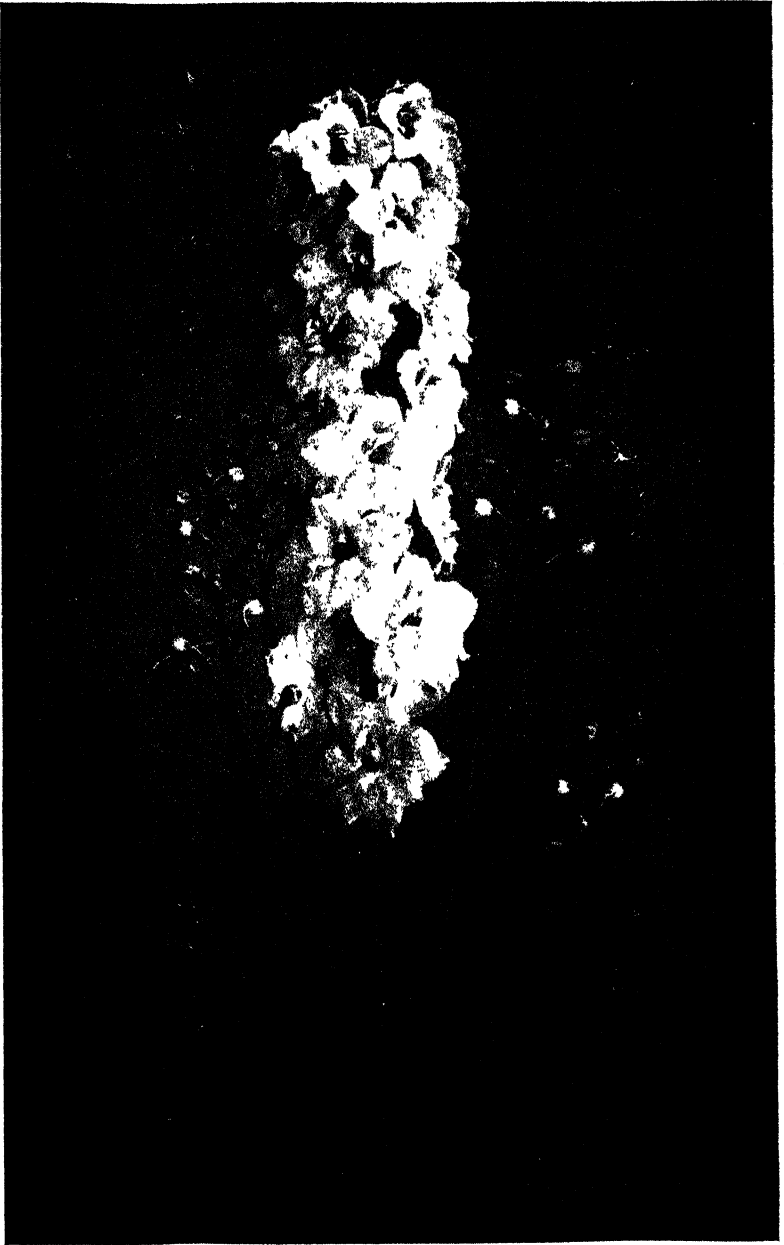


FIG 10 --DELPHINIUM ' MAUVE QUEEN,' 1925, ILLUSTRATING EARLY TYPE
(See p. 42)



FIG. 11 —DELPHINIUM 'JUDY,' 1942, DEPICTING MODERN TYPE
(See p. 43.)

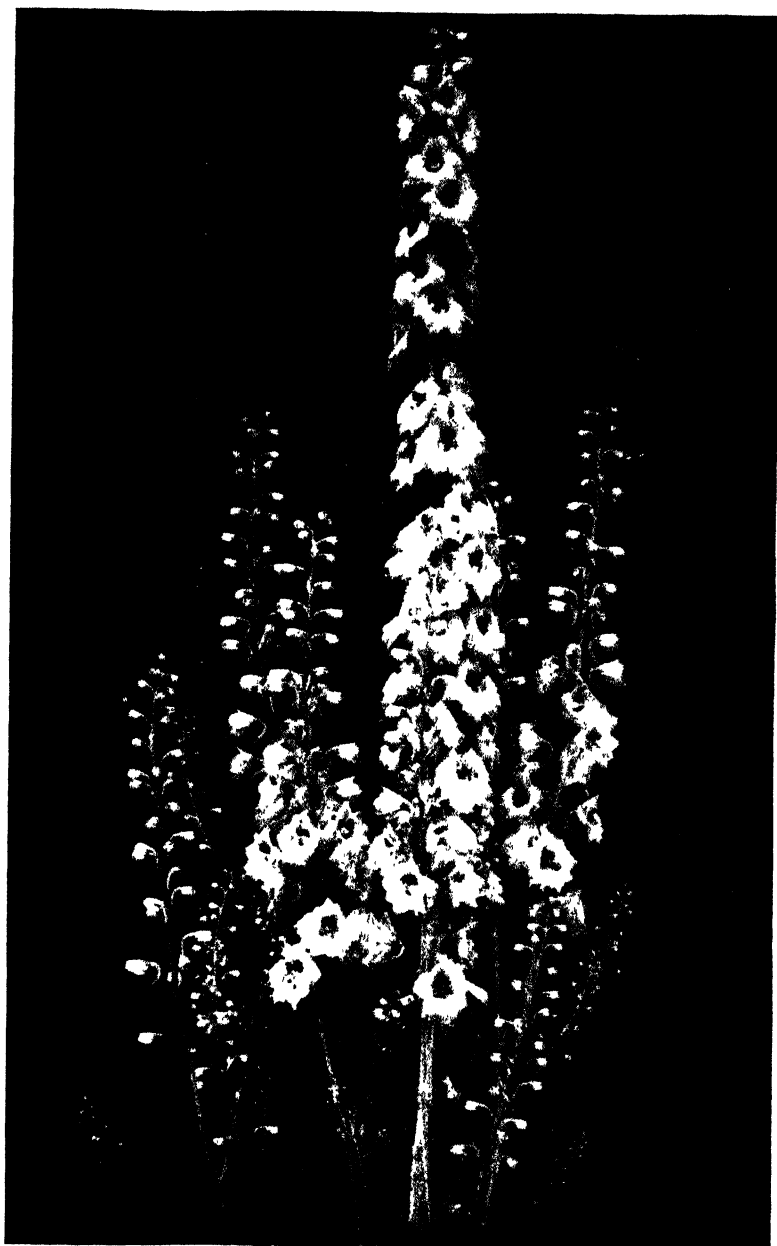
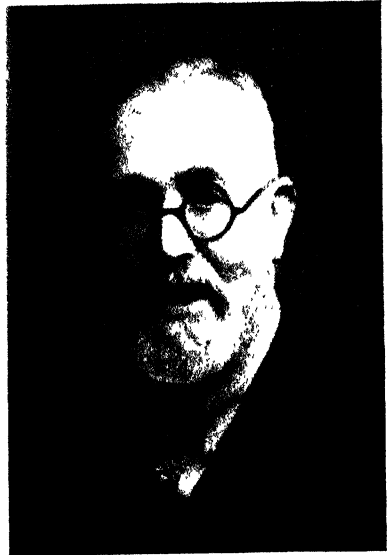


FIG 12.—DELPHINIUM 'LORNA' SHOWING NUMEROUS LATERALS
(See p. 43)



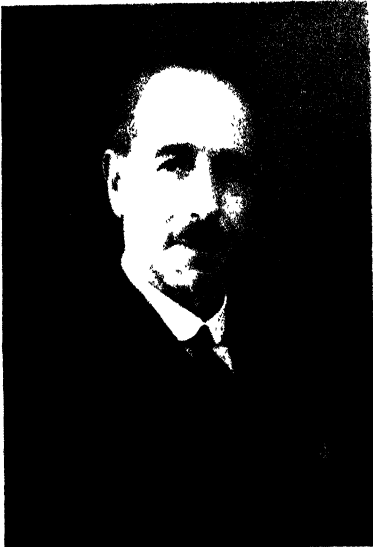
Photo, Vandyk, London.]

FIG 13 —DR J HUTCHINSON



Photo, Connold.]

FIG 14 —W E TH INGWERSEN



Photo, John Doug, Glasgow.]

FIG 15 —W D. BESANT



FIG. 16.—M. B. CRANE.

VICTORIA MEDAL OF HONOUR, 1944



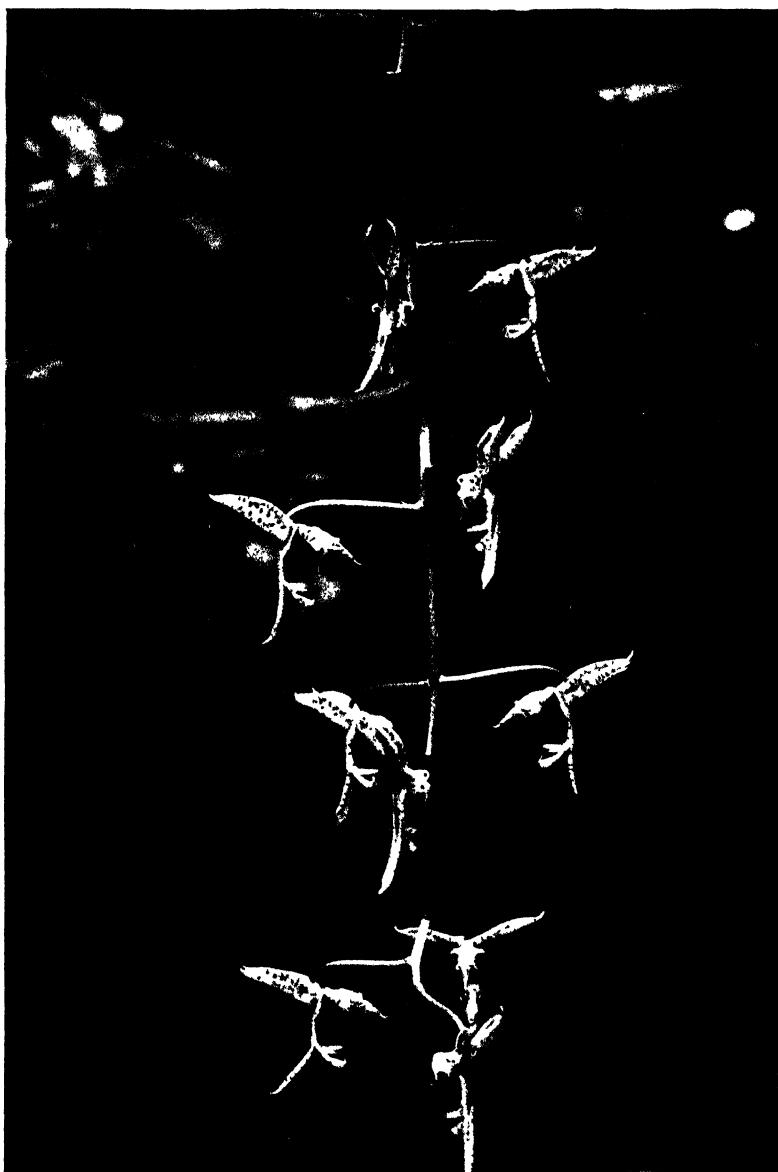
Photo, C. S. Garnett.]

FIG. 17.—*CORYANTHES SPLENDENS* FLOWERING AT KEW.
(See p. 50)



Photo, C. S. Garnett.]

FIG. 18.—CATASETUM MACROCARPUM.
(See p. 51.)



Photo, C. S. Garnett

FIG 19.—GONGORA MACULATA
(See p 52)



Photo, C. S. Garnett.

FIG 20 —CATTLEYA LUTEOLA
(See p 51)

ROYAL HORTICULTURAL SOCIETY—

1943		LIABILITIES.			
£	s. d.	£	s. d.	£	s. d.
250,000		ACCUMULATED FUNDS ACCOUNT.		250,000	0 0
15,981		LIFE COMPOSITIONS as at 31st December, 1943		16,359	0 0
703		Less Fees paid by Fellows who have died during the year		567	0 0
15,278				15,792	0 0
1,081		Add Life Compositions received during the year		1,506	15 0
16,359				17,298	15 0
3,735		BANK OVERDRAFT		6,372	6 3
4,652		SUNDRY CREDITORS		4,877	14 2
771		SUBSCRIPTIONS IN ADVANCE		849	11 8
10,000		DEPRECIATION AND RENEWALS FUND		10,000	0 0
48,339		OLD AND NEW HALLS SINKING FUND		52,855	0 10
48,339		Deducted <i>per contra</i>		52,855	0 10
3,427		SHOWS CONTINGENCY FUND		3,515	2 8
6,856		SUPPLEMENTARY PENSION FUND		7,352	6 6
500		DAME JULIA M TILDEN LEGACY ACCOUNT		500	0 0
500		MRS. A. C. CHARRINGTON LEGACY ACCOUNT		500	0 0
MEMORIAL AND OTHER TRUST FUNDS—					
688		Balances of Income Accounts in the hands of the Society, as per Separate Schedule		799	6 8
GENERAL RESERVE—					
37,431		Balance as at 31st December, 1943		39,777	12 4
507		Add Balance of Revenue and Expenditure Account, 31st December, 1943			
1,840		Amounts recovered in respect of War Damage Repairs			
		Less Balance of Revenue and Expenditure Account, 31st December, 1944		5,021	5 8
39,778				34,756	6 8
£337,266				£336,821	9 7

I have audited the above Balance Sheet, dated 31st December, 1944, and have obtained all the information and explanations I have required. In my opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Society's affairs according to the best of my information and the explanations given to me and as shown by the books of the Society.

F. G. FEATHER, F.C.A., *Auditor.*

(HARPER, FEATHER & PATERSON, *Chartered Accountants*),

4 Lloyds Avenue, London, E.C. 3

17th January, 1945.

BALANCE SHEET, 31st DECEMBER, 1944.

1943		ASSETS				
£	£		£	s. d.	£	s. d.
		OLD HALL, OFFICES, RESTAURANT, LIBRARY, AND EQUIPMENT AT COST	77,642	0 0		
77,642						
		NEW HALL, RESTAURANT AND EQUIPMENT AT COST	167,706	2 10		
167,706						
			245,348	2 10		
245,348						
		Less Old and New Halls Sinking Fund <i>per contra</i>	52,855	0 10		
48,339						
197,009		OLD AND NEW HALLS-SINKING FUND INVESTMENTS AT COST—			192,493	2 0
		As at 31st December, 1943	48,338	18 10		
43,634		Additions during the year	4,516	2 0		
4,705					52,855	0 10
48,339		(Market Value at 29th December, 1944, £54,125 7 1)				
		FREEHOLD PROPERTY, WISLEY—				
		At Cost, less amounts written off			13,105	2 11
13,105						
		BOTANICAL MAGAZINE—				
		Stock			100	0 0
100						
		DEPRECIATION AND RENFUALS FUND INVESTMENTS AT COST			10,000	0 0
10,000		(Market Value at 29th December, 1944, £10,583 14 11)				
		SHOWS CONTINGENCY FUND INVESTMENTS AT COST—				
		As at 31st December, 1943	3,427	11 0		
3,336		Additions during the year	87	11 8		
97					3,515	2 8
3,427		(Market Value at 29th December, 1944, £3,639 13 5)				
		SUPPLEMENTARY PENSION FUND INVESTMENTS AT COST—				
		As at 31st December, 1943	6,855	19 8		
6,378		Additions during the year	496	6 10		
478					7,352	6 6
6,856		(Market Value at 29th December, 1944, £7,426 12 9)				
		DAME JULIA M. TILDEN LEGACY INVESTMENT AT COST			500	0 0
500		(Market Value at 29th December, 1944, £535 4 3)				
		MRS. A. C. CHARRINGTON LEGACY INVESTMENT AT COST			500	0 0
500		(Market Value at 29th December, 1944, £511 17 5)				
		GENERAL INVESTMENTS AT COST			48,112	4 6
48,112		(Market Value at 29th December, 1944, £49,641 9 9)				
		WISLEY ADJUSTMENT ACCOUNT			482	19 11
542						
		R.H.S. DICTIONARY OF GARDENING—				
		Expenditure to date (in suspense)			1,478	10 11
1,321						
		SUNDRY DEBTORS AND PAYMENTS IN ADVANCE			6,115	0 7
7,266						
		CASH AT BANK AND IN HAND			211	18 9
189						
£337,266					£336,821	9 7

Dr.

WISLEY GARDENS—REVENUE & EXPENDITURE

		£	s.	d.	£	s.	d.
1943							
£	£ To ESTABLISHMENT EXPENSES—						
2,340	Salaries and Wages	2,511	8	8			
528	Rates, Taxes and Insurances	518	6	10			
1,000	Miscellaneous, including Donations	1,004	14	9			
158	Annuities	158	18	0			
	4,026				4,193	8	3
	„ LABORATORY AND SCHOOL OF HORTICULTURE—						
3,015	Salaries and Wages	3,359	14	4			
93	Miscellaneous	102	6	3			
44	Depreciation	41	3	7			
	3,152				3,503	4	2
	„ GARDEN—						
7,034	Salaries and Wages	7,526	0	5			
398	Plant Distribution <i>less</i> Receipts	255	18	11			
1,670	Miscellaneous	1,726	6	1			
311	Depreciation	337	17	0			
	9,413				9,846	2	5
525	„ STAFF PENSIONS	558	0	0			
263	<i>Less</i> Contributions by Staff, as per Scheme.	279	0	0			
	262				279	0	0
	<u>£16,853</u>				<u>£17,821</u>	<u>14</u>	<u>10</u>
10,786 To BALANCE, brought down					15,794	8	1
	„ SPECIAL EXPENDITURE—						
507	Provision of Storage Facilities				140	12	2
	<u>£11,293</u>				<u>£15,935</u>	<u>0</u>	<u>3</u>

ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1944. Cr.

1943

£		£	s.	d.
1,005	By DIVIDENDS AND INTEREST	1,012	4	5

„ GARDEN—

5,062	Sales and Miscellaneous Receipts	1,015	2	4
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10,786	„ BALANCE, carried down	15,794	8	1
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£16,853

£17,821 14 10

By BALANCE, being Net Expenditure for the Year,
carried to the Annual Revenue and
Expenditure Account

11,293

15,935 0 3

£11,293

£15,935 0 3

WISLEY GARDENS—BALANCE

1943	LIABILITIES.	£	s.	d.
35,870	ACCUMULATED FUNDS ACCOUNT	35,870	7	8
542	VINCENT SQUARE ADJUSTMENT ACCOUNT	482	19	11
24,480	ENDOWMENT TRUST FUND.	24,479	14	3
10,436	DEPRECIATION AND RENEWALS FUND.	10,685	7	0

£71,328

£71,518 8 10

SHEET, 31st DECEMBER, 1944.

1943		ASSETS.		
£	£		£	s. d.
		LABORATORY, DWELLING HOUSES, GLASS HOUSES, RANGES, ETC., AT COST	33,371	10 10
		N.B.—The Hanbury Trust Estate is, under the Trust Deed, vested in the Society only so long as it is in a position to use it as an Experimental Garden. Accordingly the Expenditure thereon by the Society is an Asset only so long as the Gardens continue to be used by the Society.		
		187 FUEL STOCK (valued by the Director)	172	3 0
		PLANT AND LOOSE EFFECTS (valued by the Director)—		
1,673		As at 31st December, 1943	1,591	8 8
23		Add Purchases during the year	22	8 0
			1,613	16 8
1,696		Less Depreciation of Garden and Laboratory Effects	129	0 7
	1,591			1,484 16 1
		LIBRARY—		
1,179		As at 31st December, 1943	1,262	6 0
83		Additions during the year	62	11 8
	1,262			1,324 17 8
	24,480	ENDOWMENT TRUST FUND INVESTMENTS AT COST (Market Value at 29th December, 1944, £24,803 19 0)		24,479 14 3
		DEPRECIATION AND RENEWALS FUND INVESTMENTS AT COST—		
10,186		As at 31st December, 1943	10,435	7 0
250		Additions during the year	250	0 0
	10,436			10,685 7 0
		(Market Value at 29th December, 1944, £12,241 2 11)		
	£71,328			£71,518 8 10

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position on the 31st December, 1944. In the total of Assets, £71,518 8s. 10d., are included Investments, amounting to £35,165 1s. 3d., representing Endowment and Depreciation Funds which are not available for the general purposes of the Society.

F. G. FEATHER, F.C.A., Auditor.

(HARPER, FEATHER & PATERSON, Chartered Accountants),

4 Lloyds Avenue, London, E.C. 3.

17th January, 1945.

GENERAL MEETINGS.

SEPTEMBER 28, 1944.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE, held at Wisley.
—Mr. D. INGAMELLS in the Chair, and ten other members present.

Awards Recommended :—

Award of Merit.

To 'Angela' and 'Ronald,' as exhibition varieties (votes 10 for, 0 against in each case), raised and shown by Mr. H. Shoesmith, Mayford, Woking. See p. 53.

To 'Lilliput Redbreast,' as an ornamental pot plant (votes 8 for, 0 against), raised and shown by Mr. H. Woolman, Shirley, nr. Birmingham. See p. 53.

Selected for trial at Wisley.

'Tiny Tot,' 'White Bouquet,' 'Golden Circle,' 'Angela' and 'Ronald,' all shown by Mr. H. Shoesmith, Woking.

'Lilliput Happy,' 'Lilliput Redbreast,' 'Shirley Cream,' and 'Glorious,' all shown by Mr. H. Woolman, Shirley, nr. Birmingham.

'Polar Beauty' and 'Serene,' shown by Mr. H. Shoesmith, Woking.

'Cicero,' shown by Mr. H. Woolman, Shirley, nr. Birmingham.

OCTOBER 3, 1944.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

First-class Certificate.

To *Cypripedium bellatulum album*, Borde Hill var. (votes 7 for, 1 against), from Colonel Stephenson R. Clarke, C.B., Borde Hill, Haywards Heath. See p. 53.

To *Cypripedium* × 'Milkmaid' ('Nell Gwynne' × 'Rosy Dawn') (votes 7 for, 0 against), from Lord Aberconway, C.B.E., Bodnant, Tal-y-Cafn, N. Wales. See p. 53.

Award of Merit.

To *Brassolaechiocattleya* × 'Crusader' var. 'Templar' (Bic. 'Queen Elizabeth' × Lc. 'Trivanhoe') (votes unanimous), from H. W. B. Schröder, Esq., Dell Park, Englefield Green. See p. 53.

To *Lachiocattleya* × 'Detta' (Lc. 'Sargon' × C. 'Dinah') (votes 6 for, 0 against), from Mr. S. Farnes, "Ashcroft," East Grinstead. See p. 53.

Cultural Commendation.

To Mr. Fleming, gardener to Colonel Stephenson R. Clarke, C.B., Borde Hill, Haywards Heath, for a well-cultivated plant of *Cypripedium bellatulum album*, Borde Hill var.

Other Exhibits.

About 30 photographs of Orchids in the collection of Colonel E. Middleton Perry, C.B.E., "Sutherlands," Wimbledon.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Lady BRODIE HENDERSON in the Chair, and six other members present.

Exhibits.

'Annie Biddlecombe' and 'Kathleen Stevens' (to be seen again), shown by Messrs. Biddlecombe Bros., Moss End Nurseries, Bracknell, Berks.

'Sterling' (to be seen again), shown by Mr. F. Hicks, Embrook Nurseries, Wokingham.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and seven other members present.

Selected for trial at Wisley.

'Chelmar,' 'Clyde,' 'Evelyn,' 'Golden Wedding,' 'Hestor,' 'Madge,' 'Perran,' 'Sprite,' from Messrs. Brown & Such, Ltd., Royal Berkshire Nurseries, Maidenhead.

'Christine Leworthy,' 'Dr. Skyrme,' 'Jesse Christian,' 'Ladybird,' 'Mary Edwards,' 'Mrs. Raynor,' 'Redpole,' 'Seashell,' 'Valour,' 'White Eagle,' from Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea.

Dahlias were also submitted by A. T. Barnes, Esq., Bedford.

origin. This fact, however, makes the propagation by seed an extremely interesting and fascinating pursuit. When seed is saved from the best varieties, a good percentage of really good plants will appear. Such plants should be labelled and grown on, as it is the second year of flowering which is the real test. It will sometimes be found that a promising plant refuses to make a sufficiently long spike, the pips may grow unevenly, giving a "gappy" appearance, or it may be "flat topped." These and similar faults do not always occur the first year. Occasionally, but only occasionally, a new variety will be produced—something capable of winning an award. It then behoves the grower to take every possible care of his new find. "Breaks" have been produced in this way, as we have already seen. Hybridizing, often under Mendelian principles, has been largely practised both by the trade and amateurs. This process of striving for a particular type has met with great success; many of our outstanding varieties to-day have been produced by this method. Success is not easily gained, however. It is tedious and delicate work and requires much patience, nor are the results immediate, as it takes several years to get the desired product. After this, several more years must be spent in building up a good stock. This is the reason why so many new plants (new varieties of existing plants) command what appears to be a high price.

Seed is best sown as soon as ripe, in August or September, and sown thinly in boxes of light soil placed in a cold frame. The boxes should be thoroughly soaked before the seed is sown. If this method is employed the young seedlings will be strong enough to live through the winter. As they develop in the spring, they can be pricked out and eventually planted out in their permanent quarters, generally during April and May. Many of them will flower in August.

Phenomenal as the all-round improvement in the Delphinium has been, there still remain vast possibilities for still further progress, especially as to mildew-resisting varieties. By careful selection and crossing we want to eliminate, as far as possible, "gappiness" (uneven spikes) and flat-topped spikes. "Gappiness" is, however, not always hereditary, the absence of pips here and there often being due to a check when the flower buds were forming or to the ravages of the caterpillar of the Golden Eight Moth already referred to. There is still scope for new colour combinations and "eyes" can still further be improved. During the last few years there has been a demand from some quarters for more blue selfs. This demand should be satisfied very soon: some excellent varieties of this description will shortly be available.

The British Delphinium Society, founded in 1927, has done much to stimulate interest in this plant, holding shows prior to the war in the R.H.S. Hall, Vincent Square, Westminster, and in conjunction with Horticultural Societies in the Provinces. More important than this have been the trials at Wisley, where new varieties are judged and any varieties voted as superseded are discarded. A strict register of varieties is kept and scrutinized frequently. The Joint Novelty Committee votes on the varieties placed before it. They have power to grant awards or to recommend for trial at Wisley.

I would like to thank Mr. F. C. BROWN and Mr. D. E. GREEN, both of Wisley, also Mr. JAMES KELWAY and Mr. C. F. LANGDON, V.M.H. for the information they have kindly supplied to me, also Mr. F. G. BROWN for the photographs.

ORCHIDS IN EQUATORIAL BRAZIL.

By C. S. GARNETT.

WHILST a number of true Orchids are native to Britain, and some may quite accidentally be found by anyone on a simple picnic in our English fields and meadows—there are others! Some of our indigenous species are insignificant in appearance and might easily be overlooked by a non-botanist, but this scarcely applies to the Bee Orchid (*Ophrys apifera*), and one kind that is not likely to be so easily found is the English Lady's Slipper (*Cypripedium calceolus*). One feature in which our native species differ from most of those of the Tropics is that ours are "terrestrial"—growing in the ground like most other plants, whereas most of the exotic kinds are "epiphytes" or "air-plants"—growing from the trunks or branches of trees, yet not in any degree parasitic, as Mistletoe (*Viscum album*) for example, which is a "hemi-parasite"; nor as our Toothwort (*Lathraea squamaria*) which, although growing in the ground, is a "holo-parasite"—obtaining its nutriment entirely from the roots of its host. Among our British Orchids, however, the Bird's Nest Orchid (*Neottia nidus-avis*) is an example of a "saprophyte," devoid of chlorophyll (the green colouring matter possessed by the vast majority of plants) and living entirely upon dead wood, etc., in the ground. Although epiphytic Orchids grow high in the air on trees in their native habitats, and (together with epiphytes of other Natural Orders) are known in Brazil as "Parasita," none are in any degree whatever parasitic—as our Eyebright (*Euphrasia officinalis*) for example, a facultative or "quasi-parasite," having both leaves and roots of its own and capable of working for itself but preferring to steal from the roots of grasses.

Almost all our most beautiful and exquisite cultivated Orchids are, of course, of tropical origin, either species that grow wild in such regions or their hybrid offspring.

From the knowledge of the above-mentioned manner in which so large a proportion of exotic Orchids grow in their native habitats, often but feebly anchored by a few of their roots whilst the greater proportion hang or project into the air, it was sometimes supposed that they must obtain their nutriment from the air. This was not surprising, but the fact that chemical elements which could not possibly be derived from the dust-free, humid atmosphere of the swamps and jungle enter into the composition of their body-substance was evidence that such could not be the actual case. The truth is that their roots are adapted to seize upon every trace of nutriment coming into contact with them; and this enables them to feed upon organic matter conveyed by rain-water trickling and dripping on to them and carrying with it nutritive substances from higher up in the trees. Such would be quite insufficient, however, to meet the needs of most plants, and hence it is very easy to over-feed such Orchids in cultivation.

A few years ago, the present writer chose Equatorial Brazil, the region of the mighty Amazon river, for a visit to make a study of epiphytes and orchid-hunting and collecting.

This seemingly boundless and largely unexplored part of the earth, nearly two million square miles in extent and athwart the equator in South America, provides the most fiercely wild setting imaginable for the study of nature, and incidentally, in pursuing it,

some pronounced tests of endurance which the natives frequently will not face. (On my return journey it was said to me that fools rush in where angels fear to tread!) This great "Green Hell" (as it is often called) is mainly as flat as a plain, and only a hundred feet above sea-level at about a thousand miles inland, where the mighty main stream may approach nearly a hundred miles in width at high-river season. It swarms with living things innumerable, both the most beautiful and the most deadly known, and including little known (and probably even quite unknown) tribes of naked, anthropophagous and head-hunting savages. Here, however, as might well be expected, is the place to find wonderful Orchids; but with the possible exception of one (*Acacallis cyanea*) they can scarcely be claimed to include the most beautiful species known.

Although the orchidophil may experience a distinct thrill from finding a much-coveted Orchid in the wild, the neophyte to orchid-hunting must not expect to experience much in the way of a thrill of joy at the sight of a magnificent one growing in superb luxuriance in its native habitat; on the contrary, it so harmonizes with its environment that it usually appears just the sort of flower to be expected there; and in view of the grandeur of the tropical jungle as revealed in the stupendously prolific luxuriance of the Amazonian igapó (which must be actually seen to be fully appreciated, and compared with it the Indian jungle is feeble), such flowers so perfectly harmonize with their surroundings that they seem to blend into them and rather tend to be overlooked.

That point applies even in the case of the exquisite and rare blue Orchid, *Acacallis cyanea*. The outstanding quality of this Orchid was recognized by the Orchid Committee of the Royal Horticultural Society in awarding a First Class Certificate to a plant of my collecting which had been acquired by a private cultivator and exhibited by him; but its attractiveness and beauty are far more evident when it is seen in cultivation and thus exhibited than when seen in the wild in its native habitat—although certainly not improved by cultivation.

When I was taken by an Indian from a remote village to the igapó in which I collected my plants of this species, my interpreter (in this case a German who had lived for many years in Brazil and himself an orchid-collector) said that it was a hitherto "unknown" igapó in its absolutely virgin state and that certainly no plant-collecting had ever before been done there. On account of the monetary value of this Orchid, due to its rarity and beauty, it was in considerable demand. Blue is a very rare colour among Orchids, and of the only two species of which I know (the other being *Vanda coerulea*, native of Assam and Burma) the *Acacallis* is incomparably the more beautiful. We found it at the zenith of its flowering, and as the river was at its maximum height, we were paddled by the Indian in his native "dug-out" canoe among the small Palms on the trunks of which it grows, and collected plants simply by cutting the Palms off at water-level with a machette—a type of huge hatchet-knife which everyone carries when out in these parts—and then similarly cutting-off the Palm heads. This small Palm, the Jará (*Leopoldinia pulchra*) has a fibre-covered trunk only a few inches in diameter, and this particular Orchid, which is of a climbing habit, attaches itself tightly by its roots to the fibre-covering.

A photograph was taken there and then, and was one of my most

difficult. The light on the Amazon is so extraordinarily low (for the Tropics) in its actinic power, due, no doubt, to the high humidity, that topees are neither necessary nor worn, and when photographing, comparatively long exposures are necessary anywhere ; but added to this was the dimness of the light, even at mid-day, amidst the dense vegetation of such an igaró, and the necessity of doing all the focusing and plate-changing from the extremely frail balance of the native's canoe.

Another outstanding Orchid (although certainly *not* for its beauty) which may be found by patient, diligent search among trees laden in varying degrees with other epiphytes on humus-carrying boughs is an occasional fine specimen of *Coryanthes splendens* (or the much smaller *C. Boyii*). Clinging to such a branch and in almost any position in relation to it (often appearing to have but feeble anchorage afforded by the few delicate roots in actual contact with the bark), a plant with a mass of short roots extending in an apparently useless manner into the air may be espied. The untidy mass of short, greyish roots, which usually affords shelter to a nest of the large, virulent, black tucandera ant, is surmounted by a number of conical, ribbed, green pseudo-bulbs about three or four inches in height and each carrying (usually) two coriaceous leaves about a foot in length. From the clump of pseudo-bulbs and arising from the base of one of them, an arched scape may project and hang away from and below the branch and the Orchid's upward-growing bulbs and leaves. Each scape may carry from about two to four large, fleshy or waxy, semi-translucent flowers which, in the case of *C. splendens*, are of a creamy tint liberally spotted with crimson-purple.

This orchid (in common with other species of the genus) is sometimes called the " Bat Orchid " on account of the shape and arrangement of its sepals and petals, but is more usually known as the " Bucket Orchid," due to the fact that its most distinctive feature is a bucket-like contrivance into which a fluid drips from two tap-like structures. When the bucket is full, the excess fluid overflows through a passage underneath the staminode. Insects visit the flowers in quest of its nectariferous tissues, slip into the bucket, and can only escape through the overflow passage ; in doing this, they remove the pollinia (pollen-masses) on their backs, and on visiting the next flower, slipping into its bucket, and again escaping in like manner, they leave the pollinia (from the first flower) on the stigma of this (the second) flower ; and then, in turn, carry away its pollinia, and repeat the process.

These plants were not actually in bloom when I collected them, but the accompanying photograph of *Coryanthes splendens* (Fig. 17) is of a plant that I collected and which subsequently flowered at the Royal Botanic Gardens, Kew. The leaves had fallen from the tops of the pseudo-bulbs as a result of the severity of the conditions during transit ; and the flowers are so short-lived that the Director sent me a telegram the morning they opened ; I had motored the hundred and thirty miles by lunch-time, and the flowers were commencing to fade when I left later in the afternoon. So this is not an Orchid that would be cultivated for either its beauty or its longevity, but it represents just about the zenith of Nature's evolutionary attainment in the Vegetable Kingdom.

Although Amazonia yields three species of *Cattleya*, namely *CC. superba*, *Eldorado*, and *luteola*, none is comparable in beauty with some from other parts of South America, but of them *C. superba* is

the best. It possesses elongated pseudo-bulbs about nine or ten inches in height, each carrying (usually) two almost round leaves; the flower spikes bear up to four blooms, each about five inches across, with deep pink sepals and petals and a rich crimson lip. *C. luteola* is slightly unusual for a *Cattleya* in being yellow-flowered, but the flowers are small (Fig. 20). These are Orchids which do not produce a mass of free roots, but in which the few roots adhere closely to the smooth bark of the tree, and without affording any catchment for organic detritus or shelter for an ants' nest.

Galeandra Devoniana is quite an attractive Orchid but seldom seen in cultivation. It is not scarce on the Rio Negro above Manáos, where it grows on the small Palm, *Leopoldinia pulchra*, as does *Acacallis*, and with its roots even more deeply intergrown into the fibre. It possesses stem-like pseudo-bulbs about three feet in height, with long, rather narrow leaves along the greater part of their length, and terminal racemes about six inches long, carrying several flowers, each about four inches across, and with somewhat bronze-coloured sepals and petals, and a tubular lip, almost white in colour but prettily streaked with crimson-purple.

Catasetum is a genus which certainly is more curious and botanically interesting than beautiful, and this region possesses several species. They have short, stout pseudo-bulbs, large plicate leaves, and flower spikes produced from the base of the latest pseudo-bulb. The flowers are unisexual, and the male and female blooms differ very considerably in form and structure; the former are produced much the more profusely, often solely in cultivation, and they are usually, but not always, produced on separate spikes. *Catasetum discolor* is noteworthy in that I found it to be terrestrial and not epiphytal; we always found it growing in sandy ground close to a trunkless Palm, probably the Pindóba (*Attalea compacta*), beyond Flores outside Manáos. This species can have no claims to beauty; its flowers are small and green with a purple fringe round the lip, which is inverted in this species.

Catasetum macrocarpum (Fig. 18) is a better known species, and probably has better claims to inclusion in a cultivated collection. It is plentiful near Pará, and usually occurs on the trunk of the Urucury Palm (*Attalea excelsa*), just below its leafy crown. It is a very variable species in the coloration of its flowers, which are nearly three inches across, and borne in erect scapes carrying up to about a dozen blooms. The latter vary in colour between yellow and green, and also from being almost devoid of spots, through all intermediate degrees, to being entirely deep purple on their inner surfaces. The lip is inverted and of helmet shape, and the column (staminode) carries two antennae which are very sensitive to touch and act as triggers for the shooting of the pollinia. This faculty is one of the remarkable features of the genus, and this is one of the species in which it is best developed; the twin pollen-masses form the head of a stalked carrier bearing a viscid disc at its base, which is capable of being shot quite a distance and with such force in such direction as to hit the thorax of an insect visitor with its viscid end. The pollinia adhere, and in some species (including *C. macrocarpum*) the disc contracts and brings the pollen masses into a better position for them to come into contact with the stigma of the female flower and effect fertilization. After the ejection of the pollinia, the male flower quickly wilts off.

No pen picture of Amazonia can easily convey any idea of the inevitability of insects (of one kind or another) everywhere and always, and each Orchid species often has its own particular insect visitor. In the case of *Mormodes aurantiacum* (a genus allied to *Catasetum*), the golden-yellow flowers could not be seen at any time during daylight without the presence of a species of large, shining, brilliant green bee. When I subsequently saw this plant flowering in my greenhouse at home, something seemed lacking—the bee was absent; it had come to seem necessary for its aesthetic completion.

Gongora maculata (Fig. 19) is a rather curious, small-flowered orchid in which the scape hangs so far below the branch carrying the pseudo-bulbs and their upward-growing leaves that (on account of the small size of the individual flowers and focus considerations) to have got the entire plant on one plate would have resulted in the flowers being lost and almost invisible midst the prolific vegetation in its immediate vicinity.

Whilst I collected far too many Orchids for it to be possible to mention all here—some two thousand plants, yet not more than about two dozen of any one kind and only an odd plant or two of others—it is not by any means all the Orchids found by plant-hunters in the Tropics that are worth collecting and shipping home.

ARCTOSTAPHYLOS MANZANITA

FEW garden owners interested in the Ericaceæ are likely to have escaped the fascination of this shrub, for it is strikingly unique in appearance and the difficulty attending its successful culture is more likely to whet their keenness than to damp their ardour. Though we lost our best specimen (6 feet) during the sub-zero frosts of five years ago, it is not so much tenderness which is the snag attending the growing of the plant. Rather it seems to be a dourness of disposition, including a hatred of being moved, and from what I know of it in California it seems to favour, not so much the deep peaty soils agreeable to many of its allies but dry, rather stony mediums with the fullest possible exposure, even to sea winds. And the ovate or heart-shaped leaves, so unusually thick, hard and leathery, with their sombre green veneered with a glaucous hue, suggest a maritime association.

The specific name of "Manzanita" is a term (presumably Spanish) used to denote hillside scrub of a general kind, as is "maquis" in S. Europe. Not that *A. Manzanita* comprises a large portion of California's scrub for, though common in places, it seems localised in distribution. Tree-like specimens I never met there, but the average bushes of 8 feet or so never failed to assert their peculiar note of distinction, not only the evergreen foliage but the smooth red-brown of stem and branches, so nearly resembling those of its compatriot, *Arbutus Menziesii*. The likeness to the latter was manifest also in open windy places within the sea influence, where both shrubs would develop a congested habit the better to resist the enemy.

The flowers of *A. Manzanita*, crisp, egg-shaped bells, in erect terminal panicles about 2 inches long, have always been white in our garden, but exposure may give them a slight flush and they may be quite a rich pink in California. There they appear in winter, or the

very early year, but with us the usual period is spring and they may be as late as full summer. They remain on the bushes for an uncommonly long time. The fruit I have not seen. Our old plant seemed quite content in a light and sandy alluvial soil, plus the usual mulching of leafy material given to Rhododendrons. It was never injured by average frosts, and it was bark-splitting which eventually sealed its doom, but even then the foliage appeared to be little the worse.

A. T. JOHNSON.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1944.

Brassolaellocattleya × ‘**Crusader**’ var. ‘**Templar**.’ A.M. October 3, 1944. A vigorous and showy hybrid. The spike bore four sweetly scented flowers, in colour rosy-mauve, the labellum having a frilled margin and orange-yellow central area. The result of crossing *B.-Lc.* ‘Queen Elizabeth’ with *Lc.* ‘Trivanhoe.’ Raised and exhibited by H. W. B. Schröder, Esq., Dell Park, Englefield Green. See p. xvi.

Chrysanthemum ‘**Angela**.’ A.M. September 28, 1944, as a disbudded early-flowering variety for exhibition. Flower stems 15 inches long; foliage of medium size. Flowers double, 6 inches diameter, white. Raised and shown by Mr. H. Shoesmith, Mayford, Woking, Surrey. See p. xvi.

Chrysanthemum ‘**Lilliput Redbreast**.’ A.M. September 28, 1944, as an ornamental pot plant. Plant very free-flowering, 15 inches tall, forming a compact bush. Flowers double, 1½ to 2 inches diameter, inclined to become semi-double when fully open; light coppery bronze. A race of miniature Chrysanthemums, raised and shown by Mr. H. Woolman, Shirley, nr. Birmingham. See p. xvi.

Chrysanthemum ‘**Ronald**.’ A.M. September 28, 1944, as a disbudded early-flowering variety for exhibition. Flower stems 15 inches long; foliage of medium size. Flowers double, 5 inches diameter, outer petals slightly recurved, Garnet Lake (H.C.C. 828 shading to 828/1 at base of petals). Raised and shown by Mr. H. Shoesmith, Mayford, Woking, Surrey. See p. xvi.

Cypripedium bellatulum album, **Borde Hill** var. F.C.C. October 3, 1944. A charming addition to the albino section of the genus. The flower is larger than usually seen, cream-white, and entirely unspotted. Exhibited by Colonel Stephenson R. Clarke, C.B., Borde Hill, Haywards Heath. See p. xvi.

Cypripedium × ‘**Milkmaid**.’ F.C.C. October 3, 1944. This beautiful hybrid results from the crossing of *C.* ‘Nell Gwynne’ with *C.* ‘Rosy Dawn.’ The flower is porcelain-white, the sepals and petals tinged with light green on the basal portion, and having some minute spotting. Raised and exhibited by Lord Aberconway, C.B.E., Bodnant, Tal-y-Cafn, N. Wales. See p. xvi.

Laeliocattleya × ‘**Detta**.’ A.M. October 3, 1944. The spike bore two well-formed flowers of purplish-mauve colour, the labellum effectively marked with gold veining. The result of crossing *Lc.* ‘Sargon’ with *C.* ‘Dinah.’ Exhibited by Mr. S. Farnes, “Ashcroft,” East Grinstead. See p. xvi.

SWEET OR SUGAR CORN.

By WALTER F. GILES, V.M.H.

Member of the Fruit and Vegetable Committee of the Royal Horticultural Society.

THE origin of the family of plants known as Maize or Indian Corn is lost in obscurity. Much evidence has been collected which would point to its having originated in tropical or sub-tropical America, and the earliest records of its cultivation are said to date back to the eighth century.

Certainly for generations it has been extensively cultivated in the western hemisphere, whilst in more recent times large areas have been grown in many other parts of the world where the climatic conditions are such as will ensure the cobs ripening their seeds.

In addition to the use of the grains for human food, the plants provide much feed for animals, whilst the by-products from the seeds are employed in a large number of manufacturing industries.

Whilst all of the many types in cultivation are considered to belong to one botanical species—*Zea Mays*—the variation amongst them is very considerable. Not only are the seed grains of different colours, such as white, yellow or golden, red, and black, but they also differ in texture, and are divided into several classes. Some are known as Flint Corns, Dent Corns, Pop Corns, and Sugar or Sweet Corns.

The latter, the Sugar or Sweet Corn, is really the only type which has much interest in this country for gardeners or market growers.

This type differs from other forms of Maize in that the seeds are wrinkled or shrivelled when ripe, and are much sweeter and more palatable than other types of Maize.

Sweet Corn holds much the same position in the Maize family as do wrinkled seeded varieties in garden Peas; they are definitely to be preferred when they can be obtained.

Although there is no apparent evidence to confirm the matter, it seems quite possible that the wrinkled seeded Sweet Corn may have been produced as a natural sport or mutation from one or other of the smooth seeded forms, much in the same way as the wrinkled seeded Pea is generally supposed to have originated from the round seeded.

Sweet Corn is a more modern introduction than most kinds of Maize. It is said to have been found amongst the Indians—how long they may have grown it is not known—and was brought into cultivation in the latter part of the eighteenth century. The first type known had seeds of crimson colour, but this colour has now been bred out, and most of the varieties now grown have white or yellow seeds.

For many years Sweet Corn has been a very much appreciated vegetable in the United States of America, and much good work in breeding and improving this plant has been done there. It had also found considerable favour in this country, but its popularity has undoubtedly been much enhanced during the past three or four years by the presence of so many American citizens amongst us.

More of it is now to be found in private gardens, and many market growers have raised considerable areas for supplying the demands of the markets and hotels.

It is very important, however, that only sorts suited to this country should be grown. In America there is a great range of varieties, from first earlies to very lates, but only the earlies or second earlies should be grown here.

Some years ago there was an official trial of Sweet Corn at the R.H.S. Gardens at Wisley; thirty varieties were grown, eight of which reached maturity early, eight others developed later and made useful successive crops, but the remaining fourteen were too late in maturing to give a crop in this country.

During the past fifty years I have seen trials of several hundred varieties and selections of Sweet Corn, and types which are suited for cultivation in this country are now much more numerous than they were even a few years ago.

I could give an extensive list of varieties which, from personal experience, I know would do well here in normal seasons, but seed of many of them is not at the present time obtainable in this country. Seed of one or two of the very earliest types may probably be produced here on a small scale, but generally speaking most of the supplies come from America, and under the present International situation, the number of varieties available is very limited.

A variety which has been popular in America for many years, and has also done well here, is 'Golden Bantam.' This is not the earliest variety, but it is early enough to produce cobs in this country, and seed is usually obtainable. The seeds when ripe are yellow.

Another good variety, of which seed is probably available, being early, with large cobs and yellow seed, is 'Early Golden Market.'

'Marcross,' 'Golden Sunshine,' 'The Burpee,' 'Early Cory,' 'Early Burlington,' and 'Kendall's Early Giant' are also usually quite reliable, and when seed can be obtained, these varieties could be grown with confidence.

During recent years some types of Sweet Corn (as well as of other Maize) have been raised in America which are described as "Hybrid Corn." The increased vigour of hybrid plants has long been well known to plant breeders, and when two good inbred strains of Corn are crossed, the resulting hybrid often gives much better results than either of the parental forms.

These "Hybrid" or "Heterosis" crops of Corn are usually produced by planting in the field four rows of the variety to be used as the female or seed-bearing parent, and then two rows of the variety to be used as the pollen or male parent. The female plants are "detasselled" before their own pollen has been able to fertilize their own blooms.

The hybrid seed must, however, be produced each year by crossing. If seeds of the hybrid are saved they will not reproduce themselves true, but, like other F₁ hybrids, will segregate and break up in the F₂ generation.

The cultivation and treatment of Sweet Corn is really very easy, provided certain essential points are carried out.

First of all, be sure of sowing an early maturing type, either a named variety or hybrid if seed of such is obtainable. Choose a piece of light ground, sandy or even gravelly, give it a good manuring and deeply dig it. Cold, heavy soils are not conducive to early maturity.

Some growers start the seeds in pots under glass and put them out in the open at the end of May, as is done with outdoor Tomatoes.

They will succeed in this manner if they are carefully transplanted, but the plants do not like any check to the roots.

I have generally found, however, that the plants succeed well if sown in rows where they are to stand. The rows should be three or four feet apart, and the plants left standing about two feet between each. Sowings should be made about the middle of May, so that all danger of frost is past before the plants show through the ground.

If continuous cloches are available, sowings can be made still earlier in May, and this will give the plants a longer growing season with more chance of success if the summer is not of the best.

If the plants have some good manure to keep them going they would need little watering, but they must not be allowed to dry out. It will be found that in addition to the centre stem the plants send up side shoots. When a few extra large and early cobs are required, growers sometimes take away these side shoots in order to throw all the vigour into the centre stem. For a general crop, however, it is really not necessary to do this. The cobs on the side shoots will prolong the period of cutting, and they should all be quite large enough for cooking.

It is a little difficult to describe exactly when the Corn cob is ready for use, and only experience can be relied on. Roughly speaking, they may be ready in from fifteen to twenty days after the appearance of the "silk" on the cobs, but the best method is to open one of the cobs and try the seeds. Press one or two of the seeds together, and if the result appears like clotted cream, they are about right.

To prepare for cooking, remove the covering husks and the silk, leaving the bare cob on the stem.

I cannot presume to advise on cooking. Boiling appears to be the most general way of cooking Sweet Corn. I have enquired of American friends how they cook the cobs. One said they should be boiled in water for about ten minutes, with a little salt added, and then served with melted butter. Another said boil the cobs in water for ten to twenty minutes, but do not add salt as this is said to toughen the grains. Much, however, apparently depends on the condition of the cobs, and I have no doubt that those interested will soon be able to decide for themselves when the cobs are ready, and which is the most successful method of cooking.

BOOK NOTE

"Rhubarb." Ministry of Agriculture and Fisheries, Bulletin No. 113. 8vo. 24 pp. Illus. (H.M. Stationery Office, 1944.) 9d.

The use of Rhubarb as a "fruit" is of comparatively recent date, for, although this plant has been cultivated from prehistoric times, it was the root that was formerly used for medicinal purposes, not the stems, as now. The shortage of the fruit supply during the war has increased the importance of the Rhubarb crop, and the information contained in this *Bulletin* will therefore be especially welcome. Details of cultivation, including forcing, diseases and pests, as well as a classification and description of the varieties are all included.

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Part 3

March 1945

THE SECRETARY'S PAGE.

Subscriptions and Seed Distribution.—Fellows who have not paid their subscriptions are asked to do so as soon as possible, and are reminded that the closing date for application for seeds is March 10. The particulars of the distribution were enclosed in the January JOURNAL.

Changes of Address.—Fellows and Associates are reminded that unless a change of address is received within the first week of the month, the JOURNAL of the following month will be sent to the old address. So many complaints come that the JOURNAL does not go to the right address, but it is always traced to the fact that the change of address has been received after the wrappers have passed from the addressograph to the distributors.

Programme of Meetings.—The Meeting on March 20 (12 noon to 5 P.M.) will include competitive classes for Daffodils. Daffodil competitions will also be held on April 17 and 18 (12 noon to 5 P.M.). The schedule for these competitions can be obtained from the Secretary.

Lectures will be held at 2.30 P.M. in the Lecture Room of the New Hall on both these occasions. On March 20 Mr. R. B. DAWSON, of the Board of Greenkeeping Research, will lecture on "Our Lawns and their Reconstruction," and on April 17 Mr. E. A. BOWLES will lecture on "Daffodils."

Demonstrations at Wisley.—There will be four demonstrations at Wisley this month :

Vegetable Garden.

March 7, 8 . Outdoor Seed Bed and Seed Sowing . 2-4 P.M.

Flower Garden.

March 14, 15 . Rose Pruning and Pruning of Shrubs . 2-4 P.M.

March 21, 22 . Seed Sowing and Vegetative Propagation of
Alpines . 2-4 P.M.

Fruit Garden.

March 28, 29 . Spring Spraying of Fruit Trees . . . 2-4 P.M.

Fellows and Associates who desire to attend are requested to notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey. Particulars of how to get to Wisley were given in the January JOURNAL.

The Society's Examinations.—The written examination of the Society's General Examination (Senior and Junior) will take place on Thursday, March 15.

The Teachers' Preliminary and Advanced Examinations will be held throughout the country on Saturday, March 24.

The written examination for the National Diploma in Horticulture will take place on Saturday, April 14.

Publications.—The eighth impression of "The Vegetable Garden Displayed" (2s. 3d. post free) as well as "A Guide to Vegetable Growing in Small Gardens" (1s. post free), containing five articles from the JOURNAL, are now obtainable. Both these publications are very seasonable at the present time.

WISLEY IN MARCH.

WITH the coming of spring, plants in all parts of the Gardens are awakening to renewed activity, and during March there will be plenty of interesting things to be seen in the Wild garden, Seven Acres and Battleston Hill, where some of the earliest Rhododendrons and some of the Daffodils on trial will be out before the end of the month. On inclement days an enjoyable hour or two may be spent in the glass-houses.

The Alpine house is approaching its most interesting period. Saxifrages are still very much to the fore, and those mentioned in our last note will be supplemented by a large number of variously coloured Kabschia hybrids and by members of the Engleria section such as *S. porophylla* and *S. Stribrnyi*, whose branched, crimson-purple inflorescences rise from flat, silvery rosettes. Among the Kabschias we may note some of the older hybrids, the shell-pink *S. Irvingii* and *S. Jenkinsii* and the rosy-red 'Myra,' still holding their own in competition with modern forms like 'Cranbourne,' 'Perle Rose' and 'Riverslea.' 'Ada' and 'Iris Prichard' have paler, but still very attractive, flowers, and the colour-range is still further extended by 'Cherry Trees,' 'Primrose Bee' and *Boydii* in varying tones of yellow. Primulas are represented by members of the Auricula section, including the diminutive *P. Allioni*, whose rosy-pink or white blossoms are closely set among tightly packed leaf-rosettes, the larger and darker *P. spectabilis*, *P. marginata* with lovely lavender flowers and scalloped, silver-margined foliage, together with the incomparable hybrid 'Linda Pope.' *P. Palinuri*, with large, soft leaves and crowded heads of Cowslip-scented, yellow flowers, and varieties of *P. pubescens*, such as the floriferous 'Mrs. J. H. Wilson,' are also flowering now.

Bulbous plants at their best now include several Fritillarias, *F. pudica* with deep yellow, nodding bells borne singly or in pairs, *F. bucharica* with arching racemes of waxy white blossoms and some of the less decorative species such as *F. lusitanica* and *F. Sibthorpiana*, whose colour is a blend of olive-green and purple. Some other good

bulbous plants for pot-culture are *Chionodoxa Luciliae* and its varieties *gigantea* and *alba*, *Hyacinthus orientalis*, the slender, China-blue ancestor of the less graceful Dutch Hyacinths, *Erythronium dens-canis*, the Dog's Tooth Violet and the taller, yellow-flowered *E. tuolumnense*, and *Narcissus Watieri*, the only white-flowered member of the Jonquil group. Some other species of interest at the present time are the vivid blue *Gentiana pumila*, *Shortia uniflora* var. *grandiflora*, with glossy, evergreen leaves and fringed, light pink flowers, *Lewisia brachycalyx*, a pale, modest member of this large and varied N.W. American genus, and *Plagiorhegma dubium*, with frail, lavender, Anemone-like blossoms among half-grown, bronze-flushed foliage.

Probably the most striking plant in the Temperate house this month is a large specimen of *Rhododendron ciliicalyx* covered with rose-pink buds and large blush flowers. Other members of the Maddeni series due to flower very soon are *R. polyandrum*, *R. inequale* and *R. Lindleyi*, all with large, white blooms of great beauty. The long, fragrant sprays of *Buddleia asiatica* are at their best; several Acacias, including *A. Drummondii*, *A. armata* and *A. Riceana*, are also flowering; *Loropetalum chinense* is wreathed with white blossoms like those of the closely related Witch Hazel; and *Jasminum primulinum* is bearing large and showy yellow flowers. Among the plants trained near the glass along the sides of the house, *Buddleia madagascarensis* with long, orange sprays, the yellow-flowered Hibbertias, *Hardenbergia Comptoniana* with small violet racemes, and *Kennedya rubicunda* with brick-red flowers succeeded by rich green, velvet-skinned pods, deserve mention.

In the Wild garden flowers are becoming more numerous with each successive week, and a visit is worth while if only to see *Narcissus cyclamineus* forming sheets of golden-yellow in the moister mossy beds and springing from self-sown seeds along the edges of paths and ditches. Of the shrubs none is more delightful than *Corylopsis pauciflora*, covered with fragrant, primrose-yellow flowers, and *C. Willmottiae* with longer sprays and a fortnight or so later: both, unfortunately, are liable to injury by frost. *Stachyurus praecox* and *S. chinensis* are of somewhat similar aspect though stiffer in habit. *Pieris japonica*, festooned with drooping panicles of pearly-white bells, lasts in beauty for several weeks; *P. floribunda*, from the Eastern U.S.A., forms a compact, shapely bush with erect inflorescences. By the end of the month the flowers of *P. taiwanensis*, from Formosa, will be opening.

Among the first Rhododendrons to brave the uncertain weather are *R. cilpinense*, which forms a shapely mound of bright, evergreen foliage covered with rose-flushed flowers of good substance, *R. Fargesii*, also of very neat habit and very free in the production of rather narrow, rosy bells, and *R. sutchuenense* of larger dimensions. It seems probable that these and many other Rhododendrons will flower somewhat sparsely this year in consequence of the damage they sustained in the severe frosts of last May. Of the varieties of *Camellia japonica* two showy doubles, 'Nobilissima' of purest white and blush-pink 'Marguerite Guerillon,' may be expected to flower now.

The brightest part of Seven Acres is the Heath garden, where the later varieties of *Erica carnea* and the indispensable *E. darleyensis* are still flowering. To the varied rose and red tints of these and of *E. mediterranea*, just on the point of opening, the dense, moss-green bushes of *E. arborea* var. *alpina* provide a pleasantly contrasting

background. Few of the larger shrubs are yet flowering, but *Forsythia Giraladiana* supplies a little colour for two or three weeks before it is eclipsed by the splendour of *F. spectabilis*. Agreeable scent compensates for lack of colour in the rather inconspicuous racemes of *Nuttallia cerasiformis*, as in *Osmanthus Delavayi*, whose tiny, white flowers have an extremely sweet fragrance.

GARDEN WORK.

REMINDERS FOR MARCH.

The Vegetable Garden.—It cannot be over-emphasized that it is most important that seed sowing and transplanting should only be carried out when soil conditions are favourable, rather than adhering strictly to the calendar. Times of sowing and planting given in these notes are those which represent an average for the southern half of the country and will need modification where the growing season is short or the soil cold and heavy.

Prepare a nursery seed-bed and sow the maincrop Brussels Sprouts and Leeks during the second week and early maturing varieties of Cabbages and Cauliflowers for summer cutting about the third week. Where a warm border is available make small sowings of Radishes, a suitable variety of Cabbage Lettuce and stump rooted Carrot. Providing favourable conditions are obtainable, early in the month is not too soon to sow the maincrop of Onions and Parsnips in an open position.

About the middle of the month make successional sowings of Broad Beans, Peas and Spinach. A small sowing of Parsley can be made any time during this month.

Plants of Onions from the August sowing should now be ready for planting out on a well-prepared bed, when conditions are favourable, taking care that the seedlings are not planted too deeply.

Seakale thongs which have been started into growth in a cold house or frame can now be planted into their permanent quarters. Herbs of many kinds can be increased by division at this time of the year. Onions setts can also be planted early in the month.

Cauliflower and Lettuce plants, overwintered in cold frames, can be planted in the garden towards the end of the month after being well hardened, provided favourable weather prevails at the time; Broad Beans and Peas sown in boxes in January and raised in frames can be treated in a like manner. It is advisable to provide some form of shelter, such as brushwood or similar material, to all plants transplanted from frames until they become acclimatized.

A dressing of Sulphate of Ammonia or Nitrate of Soda may be given to Spring Cabbage and Spinach which have overwintered, when the plants show signs of making new growth.

Fruit Garden.—When it is intended to form a new Strawberry bed at this time of the year, choose a time when the soil is in a good working condition; plant firmly but not deeply. These plants should be deblossomed in order to obtain good crowns for fruiting next season. Ripe fruit this season should be obtainable from established beds or from previous late summer planting. Towards the end of the month

plants in established beds should be sprayed with Lime Sulphur (1 in 30) to control Strawberry mite, and add a suitable "spreader."

Where "Big Bud" is troublesome on Blackcurrant bushes, control by spraying with Lime Sulphur solution (1 in 30), adding a suitable "spreader," when the flower racemes appear but before the flowers open, usually towards the end of the month or early in April.

Prune newly-planted Blackcurrant bushes by cutting every shoot back to two or three buds above ground level; bushes treated in a similar manner last season will not require any pruning this year. Newly-planted Blackberries and allied berries should have the weakest shoots cut down to two or three buds; retain two or three of the strongest canes and prune these back to about a foot above ground level.

Established Gooseberry and Redcurrant bushes which were left unpruned to minimize loss due to birds taking the buds should now be pruned.

To control Peach Leaf Curl on outdoor Peach and Nectarine trees spray with Burgundy mixture when the buds begin to swell.

Peach, Nectarine and Apricot trees trained on walls blossom early in the year and consequently their flowers are liable to be damaged by spring frosts; when the buds are showing pink take steps to afford protection during the actual periods of frost by covering the trees with such material as tiffany, or a double thickness of garden netting. Where tiffany or similar close material is used remove the covering each day when the temperature rises above freezing point. Care should be taken to secure the covering in such a way that the flowers are not damaged. Spruce shoots placed amongst the branches provide an excellent substitute for the above-mentioned material.

Where established Fig trees, growing on walls, have been protected during the winter, remove the protective material about the middle of the month and carry out the necessary pruning and training. March is a good month to plant a young Fig tree. 'Brown Turkey' is a reliable variety.

Flower Garden.—As soon as well-drained soils can be brought to a fine tilth, seeds of some of the hardiest annuals, such as Calendula, Candytuft, Larkspur, Nigella and Poppies (Opium and Shirley) can be sown in positions in which they are intended to flower.

To supply late blooms Sweet Pea seeds can now be sown direct on to a well-prepared site.

Sow Polyanthus seeds for next season's display; for preference sow in a nursery seed-bed in a partially shaded position such as is obtained at the base of a north wall.

Where necessary continue to transplant herbaceous perennials as soil conditions permit, and towards the end of the month plant out from cold frames Border Carnations, Violas and Brompton Stocks which have been thoroughly hardened.

Examine Gladiolus and Montbretia corms in store and prepare for planting out towards the end of the month.

About the third week of the month prune bush and standard Roses; first remove all dead, weak and unripe wood and, for garden decoration, shorten the remaining young growths from three to six buds according to their vigour. Keep the centre of the bush open.

As the flowers fade remove the spikes of dwarf spring-flowering Heaths; the late summer and autumn flowering kinds will benefit from a certain amount of trimming.

Suitable conditions prevailing most lawns will benefit from a good raking with a "springbok" lawn rake, followed by a vigorous brushing to remove any debris and stones dislodged by the raking, in readiness for mowing as soon as this becomes necessary. Do not cut too closely in the first instance. Existing bare patches should be prepared and, towards the end of this month or early April, resown with seed mixed in a little fine compost. Where it is intended to form a new lawn prepare the site thoroughly in readiness for sowing at the time stated above.

Cold Greenhouses and Frames.—A sowing of Globe Beetroot can be made in a frame, also a suitable variety of Dwarf Beans, such as 'Masterpiece'; both crops should be sown with a view to maturing in this position. Periodical sowings of Mustard and Cress can be made from the end of the month until late summer.

Seeds of Celery for maincrop supplies are usually sown about the middle of March in a slightly heated greenhouse. If some such provision can be made for the germination of the seeds, then, when large enough, the resultant seedlings can be pricked out into cold frames in April. Celeriac can be treated in a like manner.

In a suitable compost sow in pots or boxes seeds of Antirrhinums and Stocks (ten-week) and place in a cold greenhouse or frame to germinate.

Where it is desired to increase the stock of Dahlias, towards the end of the month tubers can be taken from store and carefully divided before being planted in boxes in a light compost. Stocks of early flowering Chrysanthemums can be treated in a like manner.

Tubers of maincrop varieties of Potatoes for planting can be arranged in boxes, 'eye' end upwards, and placed in a cold house or frame provided protection from frost can be given if necessary.

Seize every opportunity to harden Cauliflower and Lettuce plants overwintered in frames, also Broad Beans and Peas sown in boxes during January, with a view to planting out towards the end of the month, provided weather conditions are favourable at that time. The same remarks apply to Border Carnations, Brompton Stocks and Violas.

Harden off autumn raised Sweet Peas with a view to planting out early next month.

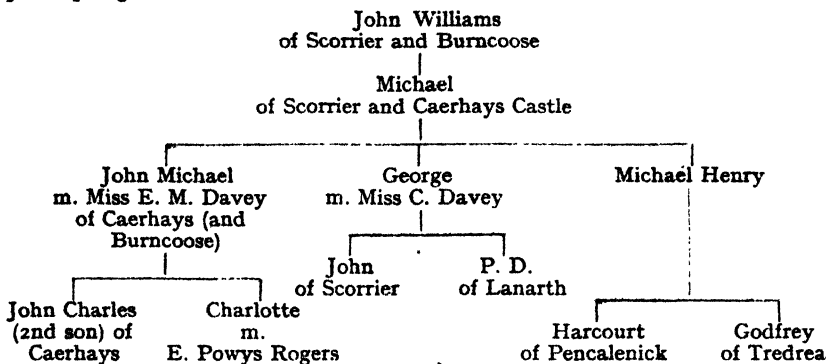
To assist the buds in "breaking" syringe the rods of Grape vines about mid-day during sunny periods when the surplus moisture is likely to dry up before nightfall. Attend to the ventilation and, as far as possible, maintain a maximum day temperature of about 45° to 50° Fahrenheit.

In an average season Peach and Nectarine trees growing in an unheated house should be in full flower towards the end of this month. Control the ventilation in such a manner that a free circulation of air without draughts is obtained at all times; maintain, if possible, a day temperature of about 45° Fahrenheit. If bees are not present means should be taken to hand-fertilize the flowers. Using a syringe for gently misting the flowers with tepid water, on warm, sunny days, will greatly assist the setting of the fruit.

THE MAKING OF LANARTH.

By THE RT. REV. J. W. HUNKIN, Bishop of Truro.

THE following extract from the genealogical table of the great family of WILLIAMS in Cornwall shows the relationship of half a dozen of its principal gardeners.



In the sixties of the last century Mr. GEORGE WILLIAMS of Scorrier bought Lanarth, near St. Keverne in the Lizard peninsula. It had for some generations been in the hands of the SANDYS family. Colonel WILLIAM SANDYS (born in 1759) died there in 1829. He had allowed a Chapel in his house to be used by the Nonconformists, and had frequently preached in it himself. Mr. GEORGE WILLIAMS found the Chapel in such a state of disrepair, that a goose was sitting on her eggs in the pulpit; the building was therefore pulled down. Mr. WILLIAMS himself continued to live at Scorrier and the house at Lanarth was merely used as a shooting box. The woodcock shooting on the estate was the best in the country.

A story is told in the family of an occasion when a party of four men went to Lanarth to shoot and stay the night. Next morning they came down to breakfast with seven sticks among them. The beds had not been properly aired.

Mr. GEORGE WILLIAMS' second son, PERCIVAL DACRES, was born at Scorrier on April 22, 1865. His mother (*née* DAVEY of Bochym) was a keen gardener, and from a boy P. D., as he became known to his friends throughout the county, took after her in that respect. Her influence was largely responsible for the wall garden at Scorrier.

P. D. was educated at Harrow under Dr. BUTLER, and at Trinity College, Cambridge, where his tutor was V. H. STANTON, afterwards Regius Professor of Divinity. He was a good and learned man, but his lectures were some of the dullest I have ever attended. P. D. matriculated in 1884, but did not take his degree till 1892, his course being interrupted by travels on the Continent.

It was in 1893 that P. D. came to live at Lanarth with his unmarried sister MABEL. In January of the following year there was not a flower-pot or a glass frame of any sort on the place.

The first entry in the Lanarth Garden Book is dated January, 1896, when the meadow in front of the house was planted. The following plants are mentioned: six double Cherries and two dozen *Azalea* hybrids from Knapp Hill, a dozen *Azalea amoena* from VEITCH'S,

Azalea mollis from various places, half a dozen *Hydrangea paniculata*, half a dozen *Viburnum plicatum*, two good-sized *Picea pungens* var. *glauca*, one *Arundinaria nobilis* from Trelowarren (sent from Singapore), *Rhododendron praecox*, some *R. arboreum* hybrids from Tremough, and some Japanese Paeonies.

The house itself faces north-east, and the meadow in front first slopes away to a little stream and then rises to light woodland at the back which had been planted as a cover for game. As you stand facing this meadow, the drive comes in on your right. It leads for three-quarters of a mile towards Coverack, and for some distance there is now a pleasant avenue of not very large Beech trees. There is room on both sides, and on one side there has been a nursery for young *Rhododendrons* and other plants. Along here *Rhododendron Falconeri* seeds itself; it is the only *Rhododendron* in the garden that does (except, of course, *R. ponticum*). Up the drive Mr. WILLIAMS planted clumps of various Bamboos, *Arundinaria japonica*, *A. Simoni*, *Phyllostachys aurea* and *P. nigra*. As you still face the same way, on your left front the garden extends to a road nearby leading to St. Keverne. The corner against this road was at this time planted with *Pinus insignis* and *Cupressus macrocarpa* for shelter, also with *Clematis indivisa*, which still may be seen a little further along climbing to the top of the *macrocarpa*.

In the young plantation above the garden Mr. WILLIAMS planted *Phyllostachys mitis*, and at the spring which is found there some *Phyllostachys Quiltoii*, a *Gunnera* from Bosahan and some Palms.

In October a herbaceous border was made on the left front of the house and some *Solanum jasminoides* put in—"a rank grower," Mr. WILLIAMS says. The same month saw the planting of seventy of WATERER'S best Azaleas with some *Dracaenas* in the background. Later on Almonds and Cherries were added, and some *Spiraea (Exochorda) grandiflora* on the lawn in front ("a good thing I saw at Trebah," Mr. WILLIAMS writes); also *Arundinaria anceps*, "a rare Bamboo according to Mitford, which I saw and purchased at Veitch's of Exeter."

December that year was very wet. On December 14 the rain gauge registered 1.76 inches in twenty-four hours.

Behind the house on the bank by the "Drying Ground" there were planted at the end of February of the following year, 1897, sixty *Rhododendron arboreum*, twenty-five *R. ciliatum* from Tremough—"nice plants with good roots, leaf mould and mica sand put in with all of them"; and a later note adds "These arboreums began to flower properly in 1906, some were still blind then."

The Garden Book regularly refers to the Cornwall Spring Flower Show at Truro. The first reference is dated March, 1897: "The flower show on the 16th was a great success. I judged the hardwood shrubs, the Tremough *Rhododendrons* were very fine indeed. The Daffodils, judged by Engleheart, were a distinct credit to the county. We got first with ten Trumpet Daffodils, and four bunches of twelve Fulgens; second with Polyanthus; and disqualified with a collection of Daffodils—too many flowers in a vase!"

Already the Garden Book contains many references to Daffodils. Daffodils raised at Lanarth are, indeed, a great subject by themselves. Suffice it to say here that in the Classified List I have counted about 420 names of Daffodils raised by Mr. P. D. WILLIAMS, not including those inset in small type as considered to be surpassed by more modern varieties.

The spring of 1897 was very wet. The Garden Book contains such notes as the following :

23rd April : " Heard the Cuckoo. New Potatoes from Coverack " (where Mr. WILLIAMS had a small garden near the sea and everything was usually a fortnight earlier than at Lanarth itself).

1st May : " May has been out on Roskymer Hill about three or four days."

4th June : " Our first dish of Strawberries. Peas will be fit in a few days."

In December that year " Six Azaleas best scarlet came from Waterer ; we put out in the New Plantation about a hundred seedling Rhododendrons raised from Nilgheriani's seed given me by G. Carlyon about 1894, they are planted E. of the house, parallel to the St. Keverne road ; also seven *R. argenteum* in the same batch. This year we have put out about two hundred *Dracaenas*." Early next year (1898) some *R. Aucklandii* from Caerhays were added. It was a very mild January.

23rd January : " Picked a sprig of bloom from *Prunus Pissardi* and could have picked several more."

13th February : " We had some plants from Japan this week, twenty Bamboos—all will probably die, the Yokohama Co. send out such small and unestablished plants ; twenty *Magnolia stellata* were in better condition—half may survive. Ten *Prunus Mume* and ten *Prunus pendula*—both appear in still better health and three-quarters should live."

Mr. WILLIAMS took a great interest in his Bamboos, of which he had about a dozen sorts ; and he was planting Birch, *Prunus* and Rhododendrons up the drive.

Next year the first entry in the Visitors' Book is the name of Miss A. B. A. DIXON (9th February), and later in the year she married Mr. WILLIAMS and came to live at Lanarth. The house was enlarged by a building of two stories on the site of the former Chapel. A photograph showing the house with its additional wing on the south is dated June, 1900.

1899 was a very dry year and the following spring was late. The Gardening Book contains photographs taken that year (1900) of Tobacco plants, *Iris Kaempferi*, *Myosotidium spectabile* (170 spikes on one plant), and the great oriental Bell-flower *Ostrowskia magnifica*, 6½ feet high. Rhododendrons and Palms did well that year.

Next year an early entry (24th March) records a nest with a thrush sitting on four eggs, and includes the laconic remark, " The garden rabbit has completely beat us this spring." Later on, 25th May, " scented Rhododendrons and *Solanum crispum* are giving nice effect just now. About a dozen Rhododendrons have flowered this year, including four *Aucklandii*." And on 2nd June, " Saw a woodpecker eating ants' eggs in one of the Rose beds close to the house."

In the following year (1902) a number of plantings are recorded. First, on 26th January : " Mr. Enys has brought us last week some (6) *Benthamias*, and *Pinus Strobus*, which we are putting in." Azaleas from WATERER and some *Camellia Sasanqua* from Caerhays followed ; and later " some Brooms from Waterer up the Drive and two *Pinus [Picea] albertiana*. Also " we are grafting some Pink Thorns, Cherries and Weeping Willows."

23rd February : " We have quite a plague of mice and are quite unable to cope with them, they have cleared the new *Iris stylosa*

which was looking well." About this time *Ribes speciosa* and two Rhododendrons ('Coombe Royal' and *Luscombeana*) came from VEITCH's, Exeter.

9th March: "Baby 'M.E.L.W.' (i.e. Mr. WILLIAMS' elder daughter MARY ELIZABETH LAVENDER) planted a Benthamia and a Pinus . . . the day after the Bishop's visit" (i.e. Dr. JOHN GOTT, the third Bishop of Truro, 1891-1906).

Towards the end of May Mr. WILLIAMS got *R.* 'Pink Pearl,' *Magnolia Watsoni*, "a new orange flowered oriental Poppy," some red Maples and a Weigelia. He records various crossings of Polyanthus, and Rhododendrons, and of *Azalea altaclarensis* × dark red *Azalea Waterer*; and the planting (from Nauheim) of *Quercus fastigiata*, two *Tilia alba* in the shrubbery, *Populus alba nivea* in the drive, and a pink *Ceanothus*, 'Marie Simon,' by "Mulberry steps." It was a very wet year "with practically no sun."

It was still wet at the beginning of the following year. So 3rd February: "Slugs very plentiful. A mild winter but a wet one so far." The same month (28th February) the Visitors' Book recorded the first visitor to come to Lanarth in a motor car, Mr. JOHN CHARLES WILLIAMS in a twenty h.p. Wolseley. In these early days of the garden the most frequent gardening visitors were (in addition to Mr. J. C. WILLIAMS) the Rev. A. T. BOSCAWEN from Ludgvan, Captain W. STACKHOUSE C. PINWILL of Trehane and Mr. ROGER TYRINGHAM of Lelant. Mr. WILLIAMS was High Sheriff of Cornwall this year.

Mr. WILLIAMS was now putting seedling Rhododendrons—*barbatum* and *Fortunei*—"up the new shooting road, by the Brake." There was a ten days gale in March, but April and May brought some new Rhododendron flowers. 9th April: "Picked one really good Rosy Red *arboreum*, long dark green leaf, white under." 1st May: "We have flowered one nice *Aucklandii* Pink × *Broughtonii*, a better one than last year."

December started cold, but: 3rd December: "Picked the first Snowdrop." Under the same date there is a record of a number of plants received from GAUNTLETT's and from Tregrehan. From the former: Rhododendrons *Nuttallii*, 'Prince Albert,' *zeylanicum*, *Gauntletti nilagiricum*; two Veronicas, *Cotoneaster pannosa*, *Senecio Clivorum*, Soliya, *Crinodendron Hookeri*, *Yucca vomerense*. From the latter: two *R. argenteum*, one *Dracaena indivisa*, six *R. campylocarpum*. Also from VEITCH: sundry Heaths, *Buddleia*, *Jasminum primulinum*, etc.

Among the entries for the next year (1904) are the following:

1st February: "Saw a flock of quite sixty goldfinches in the Cabbage garden to-day. Bullfinches are plentiful."

5th March: "*Rhododendron praecox* good."

10th March: "We put some *Eugenia Ugni* and also some *Berberis stenophylla* on the slope. Lavender planted three purple Beech for Michael Percival (Mr. WILLIAMS' only son, now owner of Lanarth and High Sheriff of Cornwall) in the grove to-day."

More Rhododendrons and Azaleas were put in the Coach Road glade; Buckthorn and *Andromeda japonica* came from GAUNTLETT's; *Magnolia stellata* was planted and did well; and on April 24 a small *Magnolia Campbelli* from Exeter was planted in the stable yard. The last was subsequently killed by paraffin from the electric plant supply. Mr. WILLIAMS replaced it by another, planted so that its roots had to

deal with a hard road, this being in accordance with his theory of its requirements; and certainly it has done well, and is doing well still.

Two *Enkianthus japonicus*, two *Magnolia stellata*, and a *Magnolia Kobus*, planted about this time, did well; and a *Drimys Winteri*, very well. In May *Lathyrus pubescens*, *Clanthus puniceus*, and *Clematis indivisa* all flowered well, and "Loder sent me a plant of *Caltha polypetalata* which came from the Vatican garden."

Next month saw planting in a new border outside the kitchen window: *Lathyrus splendens*, a *Rhyncospermum* from Captain PINWILL which did well, *Acacia Riceana* and *Boronia megastigma* which both died. There was more planting elsewhere in the garden: seedling Veronicas from Mount Usher up the drive, Coronillas, and "our first Eucalyptus." Another burst of planting is recorded in November: Rhododendrons from Tremough, "all the best varieties they have (e.g. *arboreums* 'Duke and Duchess of Cornwall,' 'Beauty of Tremough,' 'Glory of Penjerrick'), *Meconopsis* and *Primulas*: and from Smith of Newry, *Ribes splendens* and *Hamamelis mollis* (which turned out well), *Diospyros Kaki* and *Cercidiphyllum japonicum*." Mr. WILLIAMS had visited both Mount Usher and the Newry Nursery in April of that year.

From 1905 come the following items:

19th February: "Putting out some Desfontaneas and Myrtles from Scorrier, also some of the new American Oaks from France . . . also a couple of tall Maples" (*Acer nikoense*).

1st March: "I shot a cock pheasant with 125 *Celandine* buds in its crop last week." Similarly

12th March: "I shot a cock pheasant in the garden stuffed with double Primroses and *Celandine*." Under the same date is the record of sundry plants from GAUNTLETT—*Acacia longifolia*, *Ozothamnus*, *Berberis Knightii*, *Lomatia ferruginea*, etc.

15th April: "The best things here to-day are the seedling Second-cross *Aucklandiis*. We have several really good things in bloom and I am sending some to Wisley for the gardens to graft."

In November there was more planting of Rhododendrons, including *R. auriculatum* sent by Mr. J. C. WILLIAMS (which unfortunately died in 1915 before flowering), and *R. fragrantissimum*, purchased for 15s. from SMITH of Guernsey. *Mollis occidentalis* Azaleas from ANTHONY WATERER were put in the "Inner Circle" the same year—this being the inner of the two main paths round the garden.

The first entry in 1906 is dated 9th January and records a "great gale the last few days and some things have suffered. . . . *R. nobleanum* very good. Our early *arboreum* well open. *Iris stylosa* well out . . . unusually good." In February Mr. WILLIAMS purchased a number of plants from GAUNTLETT, including *Hamamelis arborea*, and two *Drimys Winteri*, one of which later on reached a height of 40 feet. They cost 3s. 6d. each.

In April six *Deutzia Vilmorinae* were planted in the "Outer Circle." In May a number of shrubs were added to the garden such as *Sutherlandia*, *Grevillea pendula*, *Buddleia Colvillei*. According to a later note in the Garden Book *Magnolia Watsoni* and a clump of *Cydonia* 'Knapp Hill Scarlet' were also planted that spring. *Myosotidium nobile* was very good that year, so also were *Solanum crispum*, *Ourisia coccinea*, *Viburnum plicatum* and *R. Aucklandii*. Under the date

4th June there is the note "Our Azaleas are quite excellent just now and really a very fine lot."

8th December: "*Cyclamen coum* beginning, Veronicas good, Tropaeolums still very fresh, and one *Rhododendron arboreum* × in bloom."

That month saw a number of plantings, including those of two Blood Red *arboreums* (a good variety from G. REUTHE), and three *Crataegus durobrivensis* from Leichlin, described by SARGENT as one of the most ornamental Thorns of the United States.

Next year (1907) there was a frost in February which killed several of the half hardy things and was the worst for years. An entry under the same date illustrates the care with which Mr. WILLIAMS sought the best variety of a plant: "Two *Erica australis* from Chalice, the true variety" with a "much better habit than usual."

Planting continued in March, e.g., of *Forsythia suspensa*, *Weigelia* 'Eva Rathke,' and Tree-Ferns from Caerhays: and later, in May, *Viburnum Carlesii* from LEMOINE, and *Hydrangea arborescens* in the Outer Circle.

It was this year that Mr. WILLIAMS was elected as a County Councillor and St. Keverne Church got its peal of bells. Mr. WILLIAMS presided at the public meeting which started the appeal for them, and the Lord Mayor of London was present at the opening of the bells on Ascension Day. They were dedicated by the Bishop of Truro, Dr. C. W. STUBBS (formerly Dean of Ely). The great church was crowded, and the provision in the large lunch tent afterwards included seventy lobsters, twenty crabs, 185 lbs. of beef, twelve quarters of lamb, five hams and thirty chickens, besides tongues, pies, sweets and salads.

There was a great deal more planting at Lanarth early in the following year (1908): *Azalea occidentalis* and *A. Hinodegiri* at the top of the slope opposite the house, where it did very well; *Corylopsis pauciflora* nearby, Romneya, *Magnolia parviflora*, *Senecio rotundifolius* along the walk where most of the R. Aucklandii were; New Zealand plants—*Olcara Traversii*, *Hoheria* (*Plagianthus*) *Lyallii*, *Hoheria populnea* (which did well): also a nice batch of *Cotoneaster frigida*, a small *Ilex diphyrena*, *Berberis Wilsonae*, and four Camellias from REUTHE.

In March a hundred *Cupressus Lawsoniana* were planted on the eastern side of the shrubbery as a wind break. "Three nice Embotriums came from Claude Daubuz and were put behind the Callistemon on the left front of the house with the others." One of the handsomest of *Picea* was also planted, *Picea ajanensis*, with leaves vividly blue-white beneath, and cylindrical cones bright crimson when young. When the R.H.S. sent a deputation to the Truro Show in April Mr. WILLIAMS received not only a Silver Flora Medal for Daffodils but another for *Polyanthus* Primroses.

In June the Azaleas were very good, especially the *occidentalis* hybrids and some others including a yellow. Mr. WILLIAMS did a good deal of crossing, both of Azaleas and of Rhododendrons. In September he ordered more Conifers, Azaleas, and hybrid Rhododendrons (including 'Lady E. Cathcart,' 'Mrs. Holford,' and 'Mrs. J. G. Millais,' all from A. WATERER).

In February next year (1909) the *Erica* hybrids were very fine. Later there were more plantings, including that of *Rhododendron grande*, and "in the autumn (October), just after I broke my leg, the

following Rhodos came from Messrs. Veitch, being, I believe, about the best of the Chinese Rhodos collected by Wilson in his first two trips; two *sutchuenense*, *Kirkii*, *auriculatum*." Mr. WILLIAMS had very brittle bones, and two other breakings are recorded in this brief narrative. Mr. WILLIAMS bore these and other pains with the utmost fortitude and never allowed them to interfere with the performance of his duties. In 1895 he became a County Magistrate and for several years he was Chairman of the West Kerrier Bench at Helston and sometimes his friends could see that he was sitting on the Bench in pain. In 1909 Mr. WILLIAMS paid a visit to Algeciras, whence he brought back "seed of an upright and also a bushy Cypress, a nice Privet from Ronda, a glaucous Fumitory from Terez, some small plants of two Thistles, a Ranunculus and a double Oxalis." He also brought back some Acacias from Granada. Things were backward this year, and there were 10° of frost in the shade in March, with much snow. Mr. E. A. BOWLES, a regular visitor at Lanarth, was there for a week this August.

Two other entries may be quoted :

6th December : "Have pricked off Wilson's No. 2 trip R. seedlings; four sorts did not germinate.

"Two fine plants have come from Caerhays—*Fortunei* × *B. R. arboreum*, and another; also some plants he ordered for me from Gauntlett—*Ungerni*, *Schlippenbachii* (which did well)."

Christmas Day : "Picked Snowdrop and *Cyclamen coum*. *R. nobleanum* has been opening a month, but we have had frosty weather for it. Planted a *Linaria* in a wall outside front gate, brought back on way back from church to-day."

January, 1910, was very wet. 5th March : "An *arboreum* × *Thompsoni* from Caerhays is in bloom and a few others."

25th March : "Planted from Penjerrick : 'Loder's White,' two pink *arboreum* (good truss, silver under-leaf), two seedling 'Glory of Penjerrick,' two *R. Roylei*."

20th May : "King Edward VII buried to-day on the thirtieth anniversary of the day he laid the foundation stone of Truro Cathedral. . . . We have just returned from Holland where we bought a red and white *Aucklandii* hybrid, raised at the Royal Porcelain factory in Berlin, and another Rhodo by way of 'Pink Pearl' but said to be a better pink."

Here is one of the most interesting notes in the whole Garden Book :

October, 1910 : "I found in Trellan valley a distinct hybrid Heath . . . on the same day I found a lovely pink form of *E. vagans* in Trellanvean downs."

Mr. WILLIAMS sent cuttings of both these to VEITCH of Chelsea to strike for him. On August 30 there is a further note :

"Dr. Groebner, Prof. Schröder, Zurich, and Mr. Druce of Oxford examined the hybrid Heath I found in October 1910 and pronounced it *E. vagans* × *Tetralix*, since it has glandular hairs and neither *vagans* nor *cinerea* have, but personally I am of the opinion that *glabrous* × *glabrous* does not necessarily give *glabrous*! and the habit of inflorescence leans more to *cinerea* than *Tetralix*. I to-day found a white form of *vagans* with creamy anthers, not crimson as usual." This Heath has been named *E. Williamsii*.

In March 1911 Mr. WILLIAMS writes: "We have in frames a lot of seedling Rhodos collected by Wilson on his 1908-9 journey to China. We also now have seed from some collected and sent home this month."

6th April: "A most unusual frost with N.E. gale—28° in a screened thermometer. Every Rhodo—and they were very good—was cut black and I doubt if even the *Aucklandii* will ever come. It was the sharpest frost we have ever seen at this season. I measured ice over one inch in thickness and water pipes and water indoors were frozen." An extremely dry summer followed, with three spells without rain. "Things have stood it fairly well." *Rhododendron* 'King George' was planted in October and did well.

Next January, 1912, *Iris stylosa* was very good after the hot season.

February 3 saw a hard frost: "13° in the screen, 21° on the grass." "The following were killed: *Brachyglottis repanda* 10 feet, *Callistemon*, *Ruscus androgynus*, *Metrosideros robusta* 15 feet, Oleander old plant, *Alectryon excelsum* eight feet, *Cytisus proliferus* 10 feet, *Bowkeria Gerardiana* 12 feet, *Pittosporum eugenioides* (variegated) 12 feet, *Leptospermum lutescens*, *Sollya heterophylla*, *Acacia armata* 10 feet, *A. verticillata* 10 feet, *A. retinodes* 18 feet, *A. longifolia* 12 feet, *A. cultiriformis* 10 feet, Psoralea, many *Dracena indivisa* etc. Badly damaged: *Ilex insignis*, *R. argenteum*, *Azara Gilliesii*, *Lapageria*, *Acacia Baileyana*, *Celastrum*, *Woodwardia*, *Dicksomia antarctica*, *Arundo Hookeriana*.

"Stood better than I expected: *Eucryphia cordifolia*, *Metrosideros lucida*, *Lomatia feruginea*, *Rhyncospermum* vars., *Grevillea ornithopoda*, *R. auriculatum* (this looked very bad that morning, leaves like lead pencils, as also all the Flax)."

In spite of this hard frost, a note dated 10th April says: "The earliest season we ever saw and the worst for gales." "The Cherries are nearly over . . . , the Magnolias are over and the Camellias. We have put out several *Griselinia* for shelter."

Earlier in the year some Chinese things were planted: *Robinias*, *Ozothamnus*, etc. A later note mentions the following, which established themselves well: *Viburnum Davidii*, *Hydrangea aspera*, Cherry *Hisakura*, *Viburnum Henryi*, *Cercis sinensis*, *Berberis verruculosa*, *Rhododendron calophytum*.

The following year (1913) was a very early year in every respect. *Rhododendron praecox* was all out on February 17, and the note dated that day records the planting of two or three acres "outside the Brake." In this were included 500 *Salix* (ten sorts), 500 *Carpinus*, 500 *Betula alba*, 250 *Laurus latifolia Bellini*, 50 *Populus charkowiensis*, 500 *Berberis stenophylla*, all from France. A later note states that in January 1913 "we saw over twenty-five woodcock in this cover of some three acres."

In October a number of plants were purchased from Coombewood at the closing of that famous nursery. These included six *Pittosporum Colensoi* at 1s. 6d. each; three *Nothofagus* at 5s. each; one *Styrax Wilsoni* at 5s., one *Magnolia Delavayi* at 7s. 6d., and one *Magnolia Wilsoni* at 10s. 6d. This last was the first to flower in England.

Lanarth Garden Notes are contained in two volumes. We have now come to the end of the first. The second begins in 1914.

In April Mr. WILLIAMS decided to fill up the old haw-haw in front of the house and carry the grass up more in a sweep (as it is to-day). Some *Leptospermum Nicholssii*, *Olearia ilicifolia*, *Griselinia*, and a good purple *Berberis* were planted to join together well-established *Hydrangea* and Cherry clumps. Additions were made to the *Heaths*, and a number of the small type of Chinese *Rhododendrons* with other

new Chinese shrubs were planted in various places. Mr. W. J. BEAN spent a few days at Lanarth this month. Mr. WILLIAMS was crossing Escalonias as well as Viburnums, Rhododendrons and Azaleas. Other acquisitions included a Chinese form of *Magnolia hypoleuca* (viz. *officinalis*), a "dagger-leaved Maple," *Acacia verticillata*, *Viburnum Sieboldii* and *Rhododendron auriculatum*. *Cladrastis sinensis* came from Caerhays, *Fothergilla major* from Kew, and seedlings of *Nothofagus obliqua* from Mr. ELWES. A good form of *R. Augustinii* flowered at Lanarth that year, also *Magnolia Delavayi*; and *Magnolia parviflora* seeded (6 of the seeds grew).

Next year (1915) some small grafted *Cornus Nuttallii* came from Exeter, a grafted plant of *Rhododendron Loderi* from Sir E. LODER, a plant of *R. campanulatum* var. *Campbelli* from J. G. MILLAIS. The last was probably a natural hybrid *campanulatum* × *arboreum*. It had a slight tinge of lilac and an immense truss perfectly formed. Other plants put in this year were: *R.* 'Dr. Stocker,' *Magnolia Campbelli*, a big plant of the Caerhays hybrid *R.* 'Blood Red' × *Fortunei*, a fine form of 'Heligan Aucklandii,' and a variegated form of *Pittosporum Mayii*. *Magnolia salicifolia* seeded at Lanarth that year.

In the winter of 1915-1916 several trees were blown down by gales. A number of different sorts of Oak came from Aldenham, three *Arbutus Menziesii* from CHARLES ELEY, and "a fine lot of Rhododendron layers and seedlings from Caerhays." In October, 1916, Mr. WILLIAMS was particularly pleased with *Pyrus Harrowiana*, from Professor B. BALFOUR, with its remarkable foliage. He notes that the plant felt the wind in the spring. Other plants acquired about this time were a nice *R. Broughtonii* var. *aureum* from VEITCH of Exeter, *R. campylocarpum* of a very distinct form in leaf, and two seedlings of the best form of *Cornus Kousa*. *Itea ilicifolia* flowered at Lanarth that year.

1917 began as an unusually late season. "From January 15th to February 16th we never had the thermometer above 35° by night, and it went as low as 23° in the screened thermometer! We had a severe East wind (60 miles an hour in the squalls) and frost with it. The severest weather since 1895! A large bush of *Teucrium* probably 30 ft. × 35 ft. was killed in but may come. Small plants of common *Dracaena*, many *Cistus*'s, *Tricuspidaria dependens*, many *Veronica*s etc. were killed outright. But things in the wind that are usually quite hardy were badly burnt, e.g. *Berberis Darwinii*, all *Escalonias*, *R. ponticum*, Bays, Tree Ferns, etc. On the other hand things have come through quite unexpectedly, *Hohierias*, *Callistemons*, *Eucryphia cordifolia*."

In his book on Rhododendrons (1917) Mr. J. G. MILLAIS refers to Mr. WILLIAMS' collection of Rhododendrons as one of the best in England and describes the most striking effect (on March 31st) of two grand specimens—*R. grande* var. *rubrum* (called crimson *argenteum*, a layer from Caerhays) and *R.* 'Duke of Cornwall' (a glowing red *barbatum* cross raised by GILL). MILLAIS also mentions a rare cross of Mr. WILLIAMS' *Griffithianum* × *Falconeri* and notes the collection of *Azalea* species and hybrids as one of the best in the country.

By this time owing to the war the garden staff was reduced to two, Mr. GREET the head gardener and Mr. HARRIS in the kitchen garden. Potatoes were growing in front of the house and Onions where the old flower beds had been. "War" Celery was good this year.

Here is an entry dated 1st December, 1917: "*R.* 'Beauty of Littleworth' layers were planted out by Humpty Bumps—Mrs. Mangles

gave J. C. and self a plant like a flag-staff three years ago and he layered it really well. I sent one to Ch. Eley and one to Carclew. I planted a *Fortunei* × *auriculatum* from Caerhays near the *Magnolia Kobus*, a nice plant. Some Azaleas from the Arnold Arboretum have come by Gomer Waterer kindly bringing them. In these days of scarcity of room on Atlantic boats it is an unusual thing. Magor sent small plants *R. eriogynum* and a Chinese form of *indica*."

About this time the Japanese Horse Chestnut, *Aesculus turbinata*, came from Edinburgh, and also the Yunnan Lilac, *Syringa yunnanensis*; and some *Ilex Aquifolium* var. *camelliaefolia*, one of the finest of green Hollies, were planted up the drive.

Next year (1918) Mr. WILLIAMS put out scores more Rhododendrons. "Rhododendrons," he writes (16th April), "better this year than I ever saw them."

September, 1918: "The wettest September in my memory, if this had come in August the magnificent 'War Harvest' would have been destroyed instead of 'damaged.' . . . The garden shrubs have not suffered from the war, but the herbaceous stuff has gone completely. . . . We had what I thought was the best orange scarlet Azalea I had yet seen, among our seedlings this year. I sent this to Caerhays to be layered—one plant to go to Millais, one to Kew)." A little later he received from Caerhays a good late scarlet Azalea of their own and an earlier one.

This autumn Mr. WILLIAMS received some Rhododendron hybrids from Mr. MAGOR of St. Tudy, the one which interested him most being *cinnabarinum* × *crassum*. He also ordered a collection of hybrid Hydrangeas from LEMOINE of Nancy. "I consider," he wrote, "we should in this garden try to keep up to date with this plant. Outside Rhodos and Azaleas no plant is more at its ease in Cornwall than Hydrangeas."

That winter Mr. WILLIAMS, at Mr. W. J. BEAN's suggestion, sent Eucalyptus seed (*Gunnii*, *coccifera* and *pulverulenta*) to half a dozen or more of the West Cornwall estates.

One of Mr. WILLIAMS' leading characteristics was an insatiable curiosity. So we find him buying out of the way plants of no particular merit, e.g. in April, 1919, Boeninghausenia, *Sorbus foliolosa* var. *pluripinnata*. More interesting were the American Oaks which came from VEITCH about the same time, and a number of small Cherries—*lutea plena*, 'Hisakura,' *Sargentii*, etc.—planted at the bottom of the garden. *Cercis racemosa* flowered this year (perhaps for the first time in England).

It was a very dry summer, followed next year (1920) by the earliest spring Mr. WILLIAMS remembered and "the wildest, roughest and wettest April." Beech leaves were out by April 5, and May in the kitchen garden by April 20. *Staphylea holocarpa* flowered this year.

(To be continued.)

JAPANESE CHERRIES.

THE variety *Prunus serrulata* *Shirotae* 'Shirotae' or 'Kojima' was inadvertently omitted from my "Key to the Cultivated Japanese Cherries" (*Journal R.H.S.*, 70, p. 16). This variety should be inserted in Section I (*Flowers white when fully expanded*) and should head the list under (C) (*All parts Glabrous*).

COLLINGWOOD INGRAM.

WHO WAS WHO ?

By A. SIMMONDS.

THOUSANDS of people who have seen countless arches and pergolas embowered with 'Dorothy Perkins,' enjoyed the delicious fragrance of the Pink called 'Mrs. Sinkins,' admired the ornamental Crab 'John Downie,' or eaten the Apple 'James Grieve,' must have wondered who those people were and inquired in vain of their gardening friends "Who was she?" or "Who was he?" And if they have sought the information in books they will have usually been disappointed, for horticultural writers are, as a rule, silent or very brief about such matters, few appearing to realize that a person who has a love for plants is not thereby precluded from ordinary curiosity about other human beings. The following notes are an attempt to meet a few of those oft-repeated but unanswered questions.

The Rose 'Dorothy Perkins,' which was introduced at the beginning of the present century by Messrs. JACKSON & PERKINS of Newark, New York, U.S.A., was named after the grand-daughter of Mr. C. H. PERKINS, the then head of the company. Miss DOROTHY PERKINS has since become Mrs. E. P. ESTABROOKE and now resides in Germantown, Pennsylvania.

Few plants have had a more lowly origin, become so widely loved, or attained such distinction, as the old double white Pink called 'Mrs. Sinkins.' It was raised in a workhouse garden; has been grown for its delightful perfume in countless gardens throughout the land; and is one of the very few florists' flowers which has been honoured with a place in armorial bearings. The name commemorates CATHERINE SINKINS, of Albert House, the Slough Poor Law Institution, where she was Matron, and her husband, JOHN THOMAS SINKINS, Master, from 1867 to about 1900. The plant was raised in the eighteen-seventies by Mr. SINKINS, who disposed of stock to Mr. CHARLES TURNER, of Slough, on the understanding that he would call the Pink 'Mrs. Sinkins.' TURNER exhibited it before our Society in 1880, when it received a First Class Certificate. Mrs. SINKINS (Fig. 24) died in 1917 and rests in the churchyard of St. Mary's, Slough. Her husband died at the age of 80 in 1926, but their son still resides in the town. On the arms granted to Slough, when it became a borough in 1938, the most prominent feature is the Buckinghamshire Swan, holding in its beak a 'Mrs. Sinkins' Pink. Incidentally, the horticultural interests of the borough are also represented by two Roses, commemorating the 'Crimson Rambler,' another plant introduced by TURNER.

The pale mauve Viola 'Maggie Mott,' which became perhaps the most widely grown of all the family, was raised by Mr. F. BURDETT, then gardener to Mr. ALBERT MOTT at Scotswood, Windlesham, Surrey, and the plant was named in honour of one of the latter's daughters, Miss MARGARET MOTT, who now resides at Leamington, Hastings, Warwickshire.

Aubrieta 'Dr. Mules' was named by Messrs. CLIBRANS, of Altrincham, in compliment to Dr. PHILIP HENRY MULES (1843-1905), a keen amateur gardener who latterly lived at The Old Parsonage, Gresford. He graduated M.D. at Edinburgh and practised most of his life in Liverpool. As a medical man he was especially interested

in the amelioration of the condition of the blind, in which connexion his work was recognized in 1884 at the International Congress at Paris, where he was a Prize Medallist, and three years later he was the recipient of the Gold Medal of the Parisian Society for the Protection of Infant Life. The origin of the plant is obscure, but Messrs. CLIBRANS think that it was raised by Dr. MULES (Fig. 25) and that they first distributed it about 1895.

Geum coccineum 'Mrs. J. Bradshaw' was named after Mrs. JOHN BRADSHAW, of The Grange, Southgate, who died in 1928 and was laid to rest in a vault near the west door of Christ's Church, Southgate. About 1905 Mr. AMOS PERRY sold two boxes of Geums to Mr. BRADSHAW, and from them the latter's gardener selected the double red type which received an Award of Merit in 1909 when named and shown by Messrs. G. & A. CLARK, of Dover. Incidentally, the gardener concerned was Mr. G. G. WHITELEGG, of Chislehurst, who subsequently established a nursery and is now well known as the builder of some of the most attractive rock gardens at Chelsea Show.

Everyone will agree that the delightful Rose 'Betty Uprichard' is a very appropriate plant to keep unfaded the memory of a very beautiful Irish lady, Mrs. E. L. UPRICHARD, of the Grey House, Newtownards. She was a neighbour and friend of the DICKSONS, who have raised so many good Roses, and often accompanied Mr. GEORGE DICKSON when he was looking over the firm's seedlings about 1921, the year in which this particular variety was introduced. Unfortunately Mrs. UPRICHARD was killed in a hunting accident in 1924.

The well-known Rose 'Frau Karl Druschki' was named after the wife of the president of the German Rose Society. The late PETER LAMBERT, of Trier, Germany, who raised it, entered the seedling in a competition organized in 1900 by a Frankfort gardening journal which offered 1,000 marks (about £49) for a new Rose which was to be called 'Bismarck.' The jury passed over LAMBERT's white Rose, and perhaps rightly, for only a blood-red flower would have been appropriate for such a name. LAMBERT was naturally disappointed, but having faith in his seedling he asked the president of the Rose Society to allow the variety to bear his name. The president thought it would be nice to call the Rose after his wife, and so it became the famous 'Frau Karl Druschki,' while the variety chosen to commemorate Bismarck has never been widely grown.

'Mme Caroline Testout' was so called by a fashionable London dressmaker of that name who purchased the variety as part of a publicity campaign. The Rose was distributed in 1890 by that great French raiser, JOSEPH PERNET-DUCHER, of Venissieux, nr. Lyons, who died in 1928. As a rule, raisers of new plants are quite naturally inclined to think more of their productions than other people, but sometimes they err in the opposite direction. This was a case in point, for at the time PERNET-DUCHER considered the pink seedling which Mme TESTOUT selected was no more than mediocre, but the dressmaker thought otherwise and, much to the raiser's surprise, she turned out to be right. Incidentally, 'Mme Caroline Testout' was the seed-parent of 'Frau Karl Druschki.' The well-known yellow Rose 'Julien Potin' was named in honour of M. JULIEN POTIN, the proprietor of a chain of grocery stores. This was another case in which PERNET-DUCHER was mistaken, for he had decided to discard the seedling when a committee of POTIN's employees asked to be allowed to purchase it as a gift to their employer.



FIG. 21. *MAGNOLIA HYPOLEUCA* AT LANARITH
(See p. 71.)



FIG. 22.—*MAGNOLIA DELAVAYI* AT LANARIH
(See p 70)



FIG. 23 -- CHARLES ROSS
(See p. 77.)



FIG. 24 -- MRS. SINKINS
(See p. 73.)

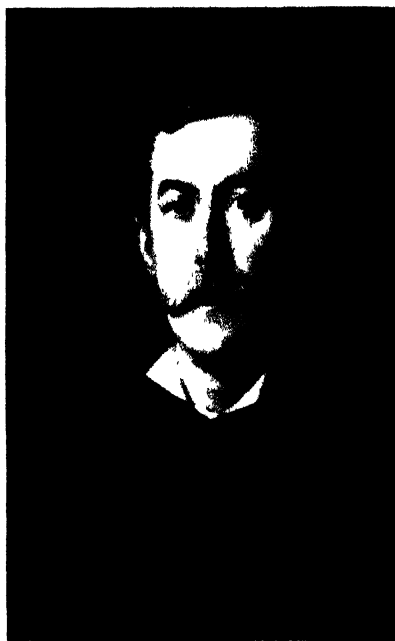
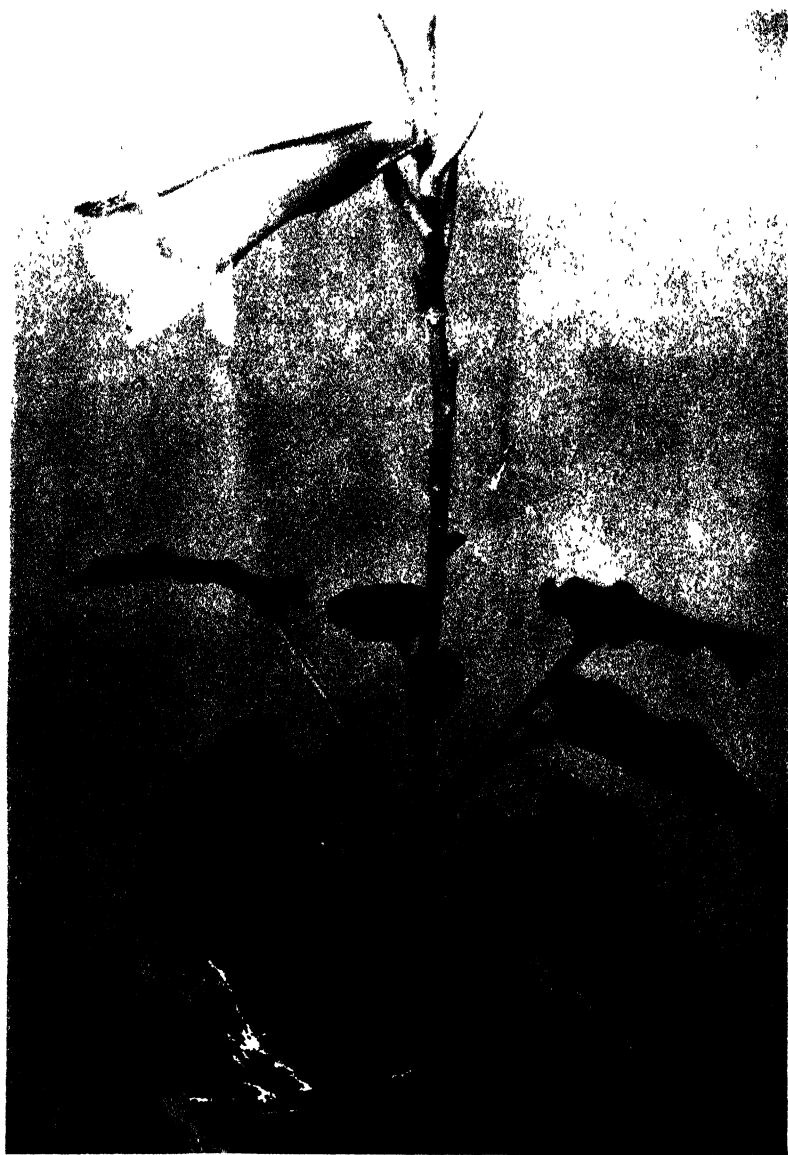


FIG. 25 -- DR. MULES
(See p. 74.)



FIG. 26 -- MRS. R. O. BACKHOUSE.
(See p. 75.)



Photo, H. F. Comber.]

FIG 27 LILIAM CATHAYANUM.
(See p. 78.)



Photo, H. F. Conber.]

FIG. 28 LITHUM CATHAYANUM
(See p. 78)



FIG. 29 — TOMATO ' DWARF GEM'
(See p. 83)



FIG. 30.—TOMATO ' DWARF GEM.'
(See p. 83.)



FIG 31 - TOMATO ' ROSEBUSH '
(See p 83)

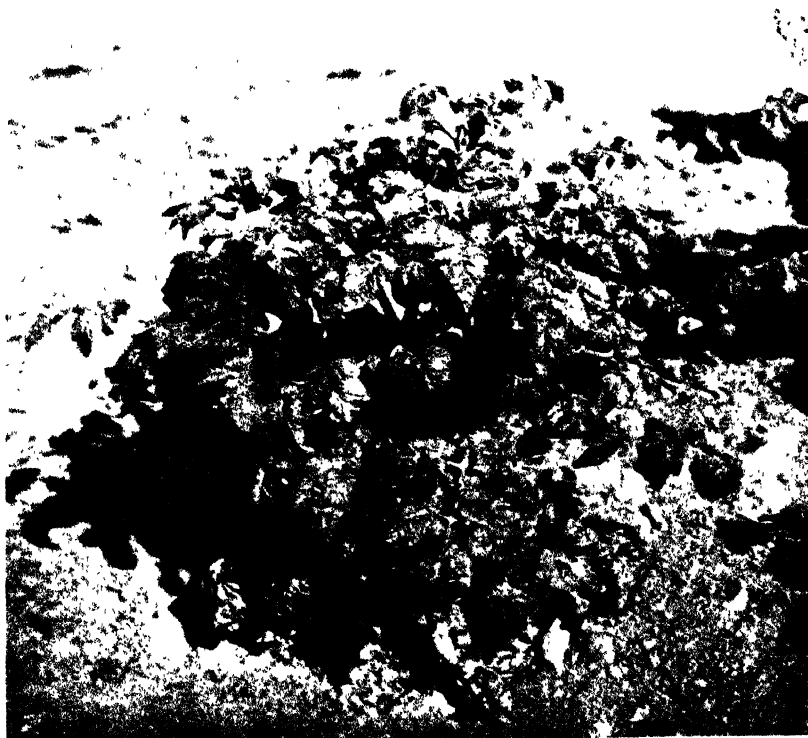


FIG. 32 — TOMATO ' STAMBOVOI ALPAFSEV '
(See p. 83.)



FIG. 33. TOMATO 'STAMBOVOI ALPAPSEV'.
(See p. 83.)

When people wore flowers in their buttonholes more often than they do to-day, the fine old orange-yellow rose 'William Allen Richardson' was a favourite for the purpose. The question—"Who was WILLIAM ALLEN RICHARDSON?"—doubtless occurred to many when gathering one of his shapely buds, and the late E. V. LUCAS once wrote an entertaining essay beginning and ending with that query. One result was a considerable and pretty mixed postbag, which included an anonymous postcard bearing the Paddington postmark and the informative message "WILLIAM ALLEN RICHARDSON was the brother of my brother's handy man." However, one communication was more useful, for it was a letter from Mr. RICHARDSON's nephew saying that WILLIAM ALLEN RICHARDSON was an American who was born in New Orleans in 1819, and lived from the age of two until his death in 1892 at Lexington, Ky. Some years ago, at Chelsea Show, I was assured by a well-known American lady that in the United States it is the ladies who are fond of gardening, and that when a man is addicted to it his business friends say of him (in much the same tone of voice that we say "He drinks!") "He runs to roses!" Well, it appears that WILLIAM ALLEN RICHARDSON ran to Roses (though I doubt whether he was any the worse for that) and, having become acquainted through correspondence with the French raiser Mme DUCHER, many of whose novelties he imported, in 1878 she paid him the compliment of naming one after him.

The very distinct yellow Cottage Tulip 'Mrs. Moon,' which has the additional good quality of a strong scent which has been likened to that of Primroses, had, like many another good plant, an obscure origin. It was first brought to notice by that astute gardener, the late F. W. BURBIDGE, who, about 1892, bought and planted in Trinity College Gardens, Dublin, 300 bulbs which he had obtained from a lady amateur gardener in the West of Ireland, who had purchased a few bulbs some years earlier, under the erroneous name of 'Ophir d'Or,' and worked up a stock. BURBIDGE consulted various recognized authorities and, finding that none knew the variety, he wrote about it in *The Garden* for May 16, 1896, illustrating the note with a coloured plate from the brush of the late H. G. MOON, to whom he had sent flowers, and suggesting in the note that the variety should be called 'Mrs. Moon' after the artist's wife. Mrs. MOON (*née* ELIZA DIEDERIECKE SANDER) was the daughter of the famous Orchid grower, the late H. F. C. SANDER, V.M.H., and the sister of Mr. FRED K. SANDER, the present head of the well-known firm of Messrs. SANDERS (St. Albans) Ltd. HENRY GEORGE MOON, perhaps of the best plant-artist of his time, lived at Herbert Lodge, London Road, St. Albans. He died in 1905 at the age of 48, and Mrs. MOON died at Liskeard in 1941.

In spite of the great progress made in the development of the Daffodil during the last twenty years, there are few novelties which more often cause non-specialist visitors to the Daffodil Show to give vent to exclamations of surprise and admiration than the pink-trumpeted variety 'Mrs. R. O. Backhouse.' This remarkable Daffodil commemorates a lady who did more than any other to improve the queen of spring flowers. Veterans of the Daffodil world still speak of the thrill which they used to get when, at the annual Daffodil Show, they watched her remove the lid of her flower-box and reveal her newest seedlings, with orange-red cups of a brightness surpassing that of the productions of any contemporary raiser. Mrs. BACKHOUSE (Fig. 26),

who was born in 1857, lived at Sutton Court, Hereford, and with the co-operation of her husband, the late ROBERT ORMSTON BACKHOUSE, raised Daffodils from about 1888 till her death in 1921. The flower which bears her name, was one of her seedlings, though it was not registered until two years after her death. Its first introduction to commerce was in an exhibit staged at Vincent Square by Messrs. BARR & Sons. The unusual charm of its pink trumpet made an instant appeal to that great patron of horticulture, the late REGINALD CORY, who at once purchased six bulbs, then a considerable proportion of the limited stock, for the sum of £250.

Delphinium 'The Rev. E. Lascelles' perpetuates the memory of the Rev. EDWIN LASCELLES, Rector of Holy Trinity, Newton St. Loe, Somerset, from 1878 to 1904, and latterly of Midhurst, Sussex, where he died in 1923. He was a keen amateur grower of Zonal Pelargoniums, Begonias and Delphiniums. The Delphinium which bears his name occurred as one of a box of seedlings which he gave to Messrs. A. WALTERS & SON, of Bath. The reverend gentleman was particularly fortunate in his gardener, who was no less a person than Mr. G. F. LANGDON, V.M.H., who, in 1900, went into business with the late Mr. J. B. BLACKMORE and has since made the name of BLACKMORE & LANGDON famous throughout the country and, indeed, wherever Delphiniums or Begonias are grown.

Helianthus rigidus 'Miss Mellish' which received an Award of Merit in 1893, when shown by the Rev. W. WILKS, was named by him after the late Miss AGNES MELLISH, of Hodsock Priory, Worksop, who died in 1934. It was from her that Mr. WILKS had obtained the plant, and she found it a few years earlier in the chaplain's garden at Stone Grange, nr. Maltby, though neither Miss MELLISH nor her gardener, Mr. J. MALLENDER, now in his hundredth year, ever learned where the plant originated.

The mention of 'Mrs. Hegarty' at once brings to the minds of gardening folk the pretty pink variety of the Kaffir Lily, *Schizostylis coccinea*, which bears that lady's name, and which received an Award of Merit in 1921 when, on the advice of that great plantsman, Sir FREDERICK MOORE, she exhibited it in London. Mrs. BLANCHE HEGARTY, who died in 1929, was the wife of Dr. JOHN ADAM HEGARTY, of Poleska, Clonbur, Co. Galway, and the mother of Lady QUINAN, the wife of General Sir EDWARD QUINAN. Mrs. HEGARTY was an ardent gardener and was so successful that "The Garden at Poleska" inspired the well-known Irish poetess, KATHERINE TYNAN, to write some charming verses under that title. The original stock of *Schizostylis* at Poleska consisted of the old red type obtained from the garden at Ebor Hall, then owned by Dr. BOYD and formerly the home of the Lord MOUNTMORRES who was murdered by the Fenians. The pink variety came up as a chance seedling in Mrs. HEGARTY's garden. Fortunately she appreciated its worth, isolated it, and raised a stock which was subsequently distributed by Messrs. BARR & SONS.

The small double yellow Wallflower called *Cheiranthus* 'Harpur Crewe,' which, in addition to other virtues, has an exceptionally long flowering season, commemorates one of the numerous gardening parsons to whom British horticulture owes a good deal—the Rev. HENRY HARPUR CREWE (1830–1883) who, during the latter part of his life, was rector of Drayton Beauchamp, near Tring, Hertfordshire. He was an enthusiastic collector and cultivator of hardy plants, especially bulbs, and was a member of our Society's Floral Committee,

over which he at one time presided. His special favourites were Crocuses, Snowdrops and Tulips, and when Sir JOSEPH HOOKER figured *Crocus Creweii* as *Bot. Mag.* t. 6188 he wrote "I have named it after . . . Mr. CREWE, whose collection of Croci is the richest in Europe." How Mr. CREWE came by the Wallflower I do not know, but, like most good gardeners, he loved to share his treasures, and his numerous friends who received this one without a name, called it 'Harpur Crewe's Wallflower'. When, in 1896, it received an Award of Merit, and Messrs. PAUL put it into commerce, they amended the name to *Cheiranthus* 'Harpur Crewe.'

The well-known dessert Apple 'James Grieve,' said to have been obtained from a pip of 'Potts' Seedling,' was introduced about 1890 by Messrs. DICKSON & Co., of Edinburgh, and named after their general manager. A few years later JAMES GRIEVE and his two sons commenced business on their own account at Redbraes Nursery, Edinburgh. JAMES GRIEVE's horticultural knowledge was by no means confined to fruit: he was a recognized authority on Violas, Rhododendrons, Pinks and Border Carnations, and was the raiser of several Rhododendron hybrids, including *Grievei*, and also the hybrid between a laced Pink and a Sweet William called *Dianthus Grievei*. He took a prominent part in Scottish horticultural affairs and the esteem in which he was held by the Royal Caledonian Horticultural Society was marked by the award of the Neill Prize. As a man he was something of a character and had a reputation for the free use of forceful language. He died in 1924 at the age of 83 and was interred in Rosebank Cemetery, Edinburgh.

The handsome Apple 'Charles Ross' was named after its raiser, who was gardener to successive owners of Welford Park, Berkshire, from 1860 till his retirement in 1908. The variety, which was obtained by crossing 'Cox's Orange Pippin' and 'Peasgood's Nonsuch,' was exhibited before the Fruit Committee in September 1899, under the name 'Thomas Andrew Knight' and received an Award of Merit. Subsequently it was renamed 'Charles Ross' and, as such, received a First Class Certificate in October 1899. The original tree is still growing in the garden at Welford Park. Ross also raised several other noteworthy Apples, including 'Rival,' 'The Houblon,' 'Renown' (all derived from 'Peasgood's Nonsuch' \times Cox's Orange Pippin'), 'Paroquet,' 'Encore' and 'Hector Macdonald,' and in recognition of his work he was awarded the V.M.H. in 1908. I remember that about that time, when he was in his eighties, he attracted my attention at one of the Society's autumn fruit shows because, with his kindly, grey-bearded face, surmounted by a billy-cock hat, he looked so exactly what he was, a fine old gardener (Fig. 23). He was born in 1824 on the Dalmeny estate, where his father was steward to Lord ROSEBURY, and died at Westgate-on-Sea in 1917 at the age of ninety-two.

It is, I believe, the normal thing for many people to conjure up, almost subconsciously, pictures of people who, through the radio, correspondence, plant names, or other means, are frequently brought to mind. And I also believe it is a common experience (it is certainly my own) to find that when eventually the person is seen in the flesh or in a photograph, he is astonishingly different from what was imagined. That sort of surprise certainly awaits anyone who, having trees of the well-known cooking Apple 'Annie Elizabeth,' has conjured up a picture of the lady after whom it was named, for Annie Elizabeth was not one person, but two. The variety was introduced

(though, apparently, not raised) by Messrs. HARRISON, of Leicester, who exhibited it in 1868, when it received a First Class Certificate. ANNIE and ELIZABETH were the two daughters of Mr. THOMAS HARRISON, the then head of the business, and as the young ladies were not even twins, one can only suppose that their father scrupulously endeavoured to avoid favouritism. I cannot recall any other varietal name combining those of two persons and wonder if 'Annie Elizabeth' is unique.

The very ornamental Crab called 'John Downie' was raised about 1875 by Mr. EDWARD HOLMES, of Whittington Nursery, Lichfield, who commenced to propagate it in the eighties. He named it in honour of his friend, JOHN DOWNIE, the well-known Scottish nurseryman, who, at one time, was a partner in the firm of DOWNIE, LAIRD & LAING, of Edinburgh, and later carried on business under his own name. DOWNIE was an authority on various florists' flowers, doing particularly good work with Pansies and Hollyhocks, and had a considerable reputation as a landscape gardener. He died at an advanced age in 1892 and was interred in the Grange Cemetery, Edinburgh.

LILIUM CATHAYANUM.

By H. F. COMBER.

IN the spring of 1939 Mr. W. A. CONSTABLE of Southborough, Tunbridge Wells, received from the Japanese nurseryman, WADA, some bulbs of *L. cordifolium* "from a new source."

In August 1939 Mr. CONSTABLE showed me plants in bud, grown from these bulbs. It was at once obvious to both of us that they were not typical *L. cordatum* (*cordifolium*), still less *L. giganteum*, but that there was a possibility of them being WILSON's new species, *L. cathayanum* (*Lilies of Eastern Asia*, p. 99). They agreed very well with the essential details of his description, though smaller, and later one of these plants was taken to Kew where, thanks to Mr. COTTON, it was compared with WILSON's type specimen. This it matched exactly in every possible detail.

A few days afterwards the two accompanying photographs of it were taken, showing the fully open flower (see Figs. 27 and 28).

The plant figured is 12 inches high, the dark green stem smooth, the leaves dark green, with sunken reticulate veins, and the persistent light green bracts are a feature of the species. The slightly drooping flower is a greenish-white outside, almost creamy-white within, with several small, sometimes confluent, purple spots at the tips of the tepals. The anthers are yellow and the stigma greenish. A few plants of this batch had two flowers, but the majority one only.

A second group, less well developed when I saw them, but of more vigorous growth, had broader leaves with fewer sunken veins. Obviously WADA had received collections from different places.

However, there can be no doubt that the illustrations are of *L. cathayanum* as WILSON knew it, although our plant is weaker and smaller than some he describes.

The original description gives it as about 2 feet to 4 feet 3 inches high, leaves dark green, shiny, mainly in one whorl, distinctly longer than broad, about $5\frac{1}{2}$ to 8 inches long, and $2\frac{1}{2}$ to 5 inches broad, reniform cordate at the base. The "short corymbose raceme" carries from 3 to 5 flowers, and a point is made about the wing of the seed being infolded. A most prominent feature of our plants and the specimens at Kew

is that the bracts persist after the opening of the flowers—longer than in the allied *L. cordatum*.

This Lily died out soon after its introduction, mainly owing to the state of the bulbs on importation and the war conditions.

It may be remarked here that Lilies of the *Cardiocrinum* section strongly resent removal and consequent loss of roots just before they are due to flower, and then rarely produce any offset bulblets or good seed. In this case the bulbs flowered and died, and all seed produced failed to germinate.

THE DUKE'S TEA TREE.

FEW gardeners seem to know the correct name of a shrub which is frequently seen all over the country, but particularly near the coast, where it is often found associated with Tamarisk. If you ask its name you will probably be told that it is the Tea Tree, but nobody knows why. It is often used as a hedge in cottage gardens, for which purpose it is admirably adapted, if kept well clipped back. Its small, dingy mauve flowers are quite insufficient to account for its wide distribution. How, then, did this shrub get here from its distant home in China? Some years ago a letter appeared in *The Times* which was headed "The Duke's Tea Tree," a title I have retained for this note, so as to avoid all confusion with another Tea Tree (*Leptospermum soperium* Forst.) called by the Maori of New Zealand, its home, Manuka. This plant has since been adopted as the national flower of New Zealand and is to be seen on some of the newer issues of postage stamps. It got the name Tea Tree because the early settlers used its leaves instead of tea when this commodity was scarce.

The Duke's Tea Tree has a much more curious history according to this letter in *The Times* from E. ROYDS of Stubton Hall, Newark, at the time of the centenary of the Empire Tea Industry. It appears that the story was originally told by the botanist SOWERBY. Here it is: "Some 100 or more years ago when the price of tea was something like 16/- a lb., the Duke of Argyll of the day, writing to the Press from Inveraray, gave it as his opinion that tea was a wholesome beverage and could, and should, be brought within the reach of all the people of these Isles. His advice was this: 'Go to your grocer, and at the bottom of the tea-boxes you will find a quantity of tea seed. Take this, sow it in a sunny spot, and carefully tend it.' The Duke asked that his letter be read from the pulpit by Ministers of all denominations."

Pondering over the legend I have just related, I failed to see why the Chinese should want to pack sprays of a shrub with squashy fruits at the bottom of the tea chests, when they take infinite pains to pack their tea as dry as possible. Furthermore these fruits do not yield up their seed any more readily than does the Tomato, a relative of the Chinese Box Thorn, to give the shrub its proper English name. ROBERT FORTUNE in more than one account speaks of the meticulous care taken by the Chinese to pack their tea as dry as possible. In his *Residence among the Chinese* (1857), after a description of how Orange flowers are used for scenting tea, he says "The flowers, at this part of the process, had impregnated the tea leaves with a large portion of their peculiar odour; but they had also left behind them a certain portion of moisture, which it was necessary to expel." However, before dismissing the legend as inconsistent with the facts, I consulted

Professor YETTS as to whether he had any explanation to offer in regard to the practice. He replied: "Seeing that means are taken to keep tea dry, I can hardly think that the fruit was packed in boxes with tea."

Some other explanation must therefore be sought for the name "Duke of Argyll's Tea Tree." It is only in the third edition (1866) of SOWERBY'S *English Botany*, edited by BOSWELL-SYME, that anything is said about the plant; "Loudon tells us that this plant (*Lycium chinense*) is commonly called the Duke of Argyll's Tea Tree from the circumstances of a Tea-plant, *Thea viridis*, having been sent to the Duke of Argyll at the same time as this plant, and the labels having been accidentally changed."

Another explanation is offered by SMITH'S *Dictionary of Economic Plants* (1882). "Its leaves resemble those of the Chinese Tea Tree, which led to its being brought into notice about a hundred years ago, by the then Duke of Argyll as a substitute for tea, for which reason it received the name of the Duke of Argyll's Tea Tree."

Going back still further, PHILLIP MILLER in the eighth edition of his *Gardener's Dictionary* (1768) says: "The fifth sort (*Lycium chinense*) grows naturally in China, from whence the seeds were brought to England a few years past and the plants raised in several gardens, and by some thought to be *Thea*."

The Chinese Box Thorn was in fact introduced into England in 1696 and had plenty of time to become naturalized before BOSWELL-SYME mentioned it in SOWERBY'S *English Botany*. We must therefore, somewhat reluctantly, abandon the legend as being inconsistent with the facts. Professor YETTS, an authority on things Chinese, tells me the Chinese Kou ch'i is generally recognized as *Lycium chinense* Mill., and that it is used as a medicine, and its leaves can be taken like tea.

The Chinese Box Thorn is often referred to in gardens as either *Lycium barbarum* L. or *L. europaeum* L., though this is incorrect as neither of these species is in cultivation.

Last October I received from my brother, who lives at Marlow on the Thames, a sprig of this shrub in flower for naming, and at the same time a handsome fruiting spray which, he said, he had found growing wild within half a mile of his garden, and thought it resembled the shrub growing in his garden, which had, however, never fruited. That appears to be a common experience. It was certainly the first time I had ever seen the berries, though I have known the shrub for many years.

The fruit is described by BEAN as a scarlet or orange berry, oblong or egg-shaped, $\frac{3}{4}$ to 1 inch long and half as wide. REHDER says that the long branches laden with scarlet fruit are handsome; apparently this plant is known in America as the Chinese Matrimony Vine. It was introduced to this country before 1709. While on the subject of names the word *Lycium* is from the Greek *Lykion*, a thorny shrub, hence the English name Box Thorn, though this particular Chinese species is often entirely unarmed.

The Box Thorns, of which there are about 100 species, belong to the *Solanum* family and thus are relatives of the Tomato, the Potato and the Deadly Nightshade (*Atropa Belladonna*).

Being aware of several apparently quite wild plants on the coast near Exeter I thought it was worth while seeing what was said about our shrub in the *Flora of Devon* (1939):

Lycium chinense Mill. Tea-plant.

Alien, China. Naturalised on sandy sea-shores, where it has assumed almost the status of a denizen, and also in a few waste places near dwellings inland. It is known in more than a dozen parishes on the shore and at four or five stations inland.

"First record : 1880. Plymouth, Briggs."

BRIGGS was a botanist after whom *Pyrus Briggsii*, a variety of the common Pear, was named.

EDWARD CAHEN.

DWARF AND BUSH TOMATOES.

By F. C. BROWN, Trials Officer.

A CERTAIN amount of interest has been aroused during the past year or two concerning several varieties of Dwarf and Bush Tomatoes which have been described as heavy, early croppers and of self supporting habit, requiring little or no staking and the minimum of training and disbudding. It was decided to grow some of these varieties at Wisley in 1944 to see how they behaved in comparison with the well-known and tried varieties.

The Dwarf and Tree Tomatoes—other than the true Tree Tomato, *Cyphomandra betacea*, a greenhouse shrub—have been known and grown, perhaps rather spasmodically, over a number of years, dating back to as far as 1862, when Messrs. Sutton and Sons, Ltd., of Reading, offered the variety 'Upright' or 'de Laye'; a similar variety was listed in 1912 by Messrs. Vilmorin-Andrieux et Cie of Paris as 'Rouge à tige raide de Laye,' another known as 'Rouge naine hâtive' appeared in the same list. In the *Standard Cyclopedia of Horticulture*, by L. H. Bailey, the following varieties were grown in the U.S.A.—'Dwarf Champion,' 'Tree,' and 'Dwarf Giant'; the last is claimed to be very hardy. Other varieties which have appeared at various times are 'Veitch's Dwarf Red,' listed by Messrs. Sutton and Sons, Ltd., in 1915, 'Burpee's Dwarf Giant,' 'Dwarf Stone' and 'Golden Dwarf Champion,' catalogued by Messrs. W. Atlee Burpee and Co., of Philadelphia, Pa., U.S.A., in 1937. So it appears that dwarf-growing forms of the Tomato have been in commerce for a number of years.

During 1944 ten varieties were grown at Wisley, and these may be grouped in four main divisions :

a. Plants of dwarf, sturdy upright growth, with coarse, very dark green foliage and almost self-supporting; this comprised the following varieties : 'Stambovoi Alpapsev,' 'Lilliput,' 'First in the Field' and 'Premier.' This type is figured and described in *The Vegetable Garden* by VILMORIN-ANDRIEUX as the 'Tree Tomato' and is listed by Messrs. VILMORIN-ANDRIEUX et Cie of Paris in 1912 as 'Rouge à tige raide de Laye.'

b. Plants with normal foliage and prone spreading habit; the terminal growth bud does not develop and so induces the plant to produce many side growths, so forming a low spreading bush; this was represented at Wisley by 'Dwarf Gem,' 'Rosebush' syn. 'Fargo,' and 'Bison.' This type is figured and described in *The Vegetable Garden* as 'Early Dwarf Red' ('Rouge naine hâtive'), and is also listed in 1912 by Messrs. VILMORIN-ANDRIEUX et Cie.

c. Plants with very thin, spindly spreading growths and narrow feathery foliage, very dwarf, early ripening and prostrate habit. This type was represented by 'Selection in the Farthest North.'

d. Plants semi-dwarf, rarely exceeding 2 feet tall, with normal large foliage, blind after the third and rarely producing a fourth truss, early ripening, crop borne principally on the first or second trusses. This type was represented by 'Early Chatham' and 'Victor.'

The seed of all the varieties grown at Wisley in 1944 was sown on April 5, 1944, and planted out on May 31, 1944, in rows $2\frac{1}{2}$ feet apart, $1\frac{1}{2}$ feet separating the plants in the rows. The dwarf varieties were allowed to grow naturally, no training, disbudding or staking in any form was carried out. Those in divisions *b* and *c* were strowed to prevent the foliage and fruits resting on the soil, and those in *d* were staked. Other varieties than "dwarfs" were grown for comparison. These were given the normal treatment for the cultivation of outdoor Tomatoes, as described in the report on "Outdoor Tomatoes at Wisley, 1940," which appeared in the December, 1940, number of the R.H.S. JOURNAL, Vol. 66, p. 445. The whole were sprayed with a colloidal copper spray during early August against the Potato Blight, *Phytophthora infestans*; no disease appeared.

Crop Weights (in lbs.).

Column 1 represents ripe fruit gathered from the plants.

Column 2 represents fruit gathered green.

Column 3 represents total crop from 42 plants.

Column 4 represents date when fit for use.

Variety.	Source.	1.	2.	3.	4.
<i>Division a.</i>					
Stambovoi Alpapsev . . .	J. H. Garlick	60½	75½	136	21/8
Lilliput	E. G. Finch	68½	85½	154	12/8
First in the Field . . .	Harrison (Leicester)	53½	114	167½	10/8
Premier	D. F. Brown	50½	119	169½	14/8
<i>Division b.</i>					
Dwarf Gem	F. Stonor	110½	70½	181	8/8
Rosebush	Bakers'	63½	109½	173	21/8
Bison	J. H. Garlick	106½	42½	149	8/8
<i>Division c.</i>					
Selection in The Farthest North	Agric. Research Council	24½	15	39½	1/8
<i>Division d.</i>					
Early Chatham	Agric. Research Council	106½	4½	110½	12/8
Victor	Agric. Research Council	121	16	137	21/8
<i>Normal Types.</i> . . .					
Sunrise	Lease Lend from U.S.A.	131	87	218	23/8
Devon Surprise		82	116	198	9/9
Earliana		152½	27	179½	24/8
Ailsa Craig		99½	84½	184	31/8
Kondine Red		111½	89	200½	20/8
Market King		125	90½	215½	21/8
Recruit		102½	59	161½	21/8

DESCRIPTIONS.

Stambovoi Alpapsev. Plant at first of close, compact upright habit, short-jointed, becoming when fully grown loose in form with coarse, rough, dark green foliage; fruit borne off the ground somewhat corrugated, flattish, very fleshy and many celled. Said to be of Russian origin.

First in the Field; Lilliput; Premier. Characters of 'Stambovoi Alpapsev,' but with somewhat greyer foliage.

Dwarf Gem. Plant of low spreading habit, forming a semi-compact bush; fruits borne close to the ground, regular and of good shape, inclined to be flattish, two to four celled. Raised by Mr. F. STONOR.

Rosebush. Habit sprawling, and semi-upright with 7 to 9 main growths; fruits borne rather close to the ground, difficult to pick, roundish, two or three celled. Syn. 'Fargo.' Canadian origin.

Bison. Habit intermediate between 'Dwarf Gem' and 'Rosebush,' with 6 to 8 main growths; fruits on the ground, large, coarse, badly shaped and corrugated, splits very much, very fleshy and many celled; originally of Canadian origin.

Selection in the Farthest North. Plant produces very thin, spindly and prostrate growths with narrow feathery foliage; fruits small, rarely exceeding 1 inch diameter, carmine-red, round and regular, very early ripening. Canadian origin. Not suitable for this country.

Early Chatham. Semi-dwarf habit, the growing point blind after the third truss, early ripening; fruits large, regular, not corrugated, fleshy and many celled, inclined to split. Canadian origin.

Victor. Of 'Early Chatham' habit; fruits large and regular, very "meaty" with few seeds, a tendency for some plants to produce only one truss and others to produce more than four. Canadian origin.

NOTES.

It would appear that the varieties 'Bison,' 'Dwarf Gem' and 'Rosebush' should be pruned and disbudded, also a certain amount of support is required, the plants may be restricted to four main growths, stopping at the second or third truss and all side growths removed, supporting each growth by wires or stakes. 'Early Chatham' and 'Victor' require staking with a 2-foot stake, no stopping and little disbudding is necessary. 'Stambovoi Alpapsev,' 'First in the Field,' 'Lilliput,' and 'Premier' need to be restricted to one main stem and be treated in a similar way to outdoor varieties. 'Selection in the Farthest North' requires strawing, no disbudding or stopping necessary.

Too much attention should not be paid to the weights recorded for the individual varieties, for it is recognized that in trials conducted on ground apparently uniform, plots of the same variety which have received identical treatment may produce weights differing by as much as 20 per cent. The figures of the recorded weights, should, therefore, be taken only as a general indication of the cropping qualities of the variety.

(Illustrations, Figs. 29-33.)

THE CARROT FLY AND ITS CONTROL IN GARDENS.

By G. FOX WILSON.

(Entomologist, R.H.S. Laboratory, Wisley.)

AT the request of Dr. H. V. TAYLOR, Commissioner for Horticulture, investigations have been carried out at Wisley over a period of three years (1942-44) of measures of control against Carrot Fly in relation to the conditions prevailing in gardens and allotments.

The control measures to receive special attention were chiefly cultural, and included the effect of (i) staggered sowings (namely, nine fortnightly intervals from the end of March to the third week in July), (ii) the date of harvesting the crop, (iii) the site of the bed, and (iv) the absence of cultivation (*i.e.* no singling, weeding or hoeing operations), to ascertain their relative effectiveness upon the incidence of attack on five varieties of Carrots. A further control measure, namely, (v) chemical, in the form of a poison bait against the first and second generations of flies, was included in the 1944 trials.

The purpose of this note is to outline briefly the life history and habits of the pest, the nature of its damage, and measures to be taken for avoiding outbreaks. A full account of these investigations will be published elsewhere (*Annals Applied Biology*).

The biology of *Psila rosae* F. has been intensively studied by BAKER *et al.* (1), BARNES (2), and PETHERBRIDGE *et al.* (4, 5), and space will not allow a full discussion of their several observations except so far as they affect those undertaken at Wisley.

Host Plants.—The fly is chiefly important as a pest of Carrots grown both as a commercial crop on farms and in gardens and allotments. Parsnips and Parsley also serve as host plants in some districts, while Celery stalks and Celeriac roots are occasionally extensively tunneled by the maggots. While the roots of Hemlock (*Conium maculatum*) are frequently attacked, those of wild Carrot and other wild umbelliferous plants have so far been found free from injury (4).

Nature of Damage.—Injury by the maggots is caused by their boring into the roots, which become "rusty," while seedling Carrots may be killed owing to the larval tunnels extending throughout the core as far as the crown (Fig. 34, a). Damage to the older plants causes stunting and malformation of the roots due to the destruction of the tap-root (Fig. 34, b). The mature roots are often attacked at several points (Fig. 34, c), and at this time the legless maggots are seen protruding from their shallow mines.

The first indication of an attack is the wilting of the foliage, especially during a period of drought, due to root injury and to a break-down in the water-conducting system. The leaves redden in a manner of premature autumnal tinting, which is another indication of injury to the root system.

An invasion of secondary organisms may follow severe attacks, with the result that the roots decay when left in the ground and when clamped. Heavily attacked Carrots are far more susceptible to frost damage than clean roots.

Life History.—The Carrot Fly is a shiny black insect about $\frac{1}{8}$ inch in length, with a reddish-brown head, yellowish legs, and with one pair of iridescent wings with an expanse of about $\frac{1}{8}$ inch. The eggs

are minute, white and elongate, and are laid in crevices in the soil near the roots. The colourless maggots emerge in 7-10 days and feed on the tap-root and side roots. Later, they burrow extensively into the main root and may pass from one root to another, especially in rows of seedlings and in mature roots that are allowed to remain in the ground after October. When fully grown, the thin, wiry, yellowish larvæ leave the roots and pupate in the soil as brownish-yellow puparia from which the flies eventually emerge.

Two generations of flies occur in a year, the first appearing at the end of April, throughout May and into early June. The second-brood flies appear in late July, being most abundant during August and early September, which period may extend into early October, depending upon the age of the crop and the date of emergence of the summer brood.

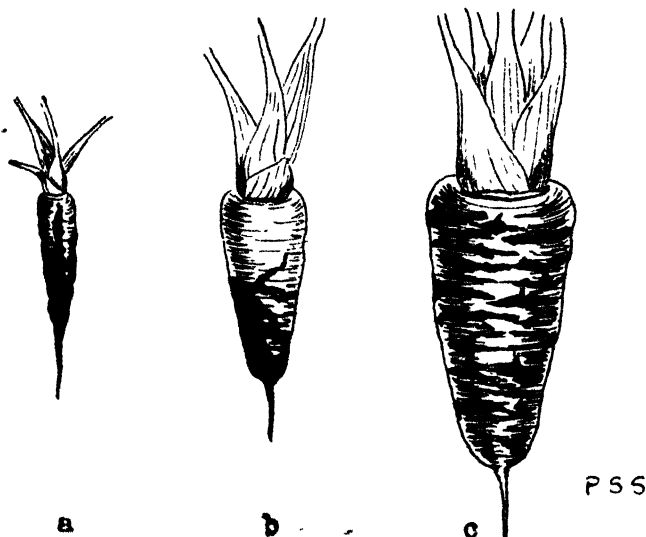


FIG 34.—Carrot Fly damage to (a) seedling, (b) partially mature, and (c) mature roots of Carrot, var. 'Early Market.'

The first appearance and the peak emergence of both broods are dependent upon climatic conditions, upon the area of Carrots grown in the immediate neighbourhood the previous year, upon the degree of attack on early crops, and upon soil factors.

Habits.—The Wisley observations confirm those of other workers (1, 2, 4) that the Carrot Fly exhibits marked behaviour practices, and a review of those that are directly concerned with the incidence of the pest and its possible avoidance will be discussed.

The flies suddenly appear, often in vast numbers, soon after their emergence from the puparia. There is a period before egg-laying of some 10-15 days, during which time the flies are found in the neighbourhood of the previous Carrot crop, and it is for this reason that it is desirable—apart from normal rotational practices—to choose a fresh site for the crop each year. The distance that can be arranged between the site of the previous and current year's crop is negligible in small areas (gardens and allotments), and a high local population of the flies may be built up rapidly. The natural checks on the increase of the pest are parasites (2) and unfavourable weather conditions.

Many dipterous pests (e.g. Cabbage Root Fly, Onion Fly and others) are attracted by the presence of decaying organic matter in the soil, and ground intended for a Carrot crop should not receive dressings of *fresh* manure unless such applications are made some months previous to sowing, and then not as surface dressings.

The tendency of the Carrot Fly to assemble in large numbers in hedges and other shelter is very marked. Coarse herbage, growing crops (especially Potato), and weeds (especially Nettles) provide favourable alternative shelter against wind. The heaviest infestations on the trial plants at Wisley occurred on those beds facing north, where protection from the prevailing south-west wind was afforded by 8-foot Hornbeam hedges on their southern and western sides. Even wind of low velocity will tend to drive the flies to that side of the hedge sheltered from air-movement. In the case of Carrot beds with a southern aspect, the highest percentage of damage invariably occurred on those roots which were growing nearest the hedge. This is due to the fact that the flies tend to make short trips from the hedge to the bed when the wind is blowing lightly.

Again, some of the worst outbreaks occurred when the Carrot rows were adjacent to Nettle beds and to a Potato crop, which afforded the flies shelter from wind and provided shade during high temperatures and intense sunlight. Carrot foliage in itself does not appear to provide such attractive shelter to the flies as the aforementioned shelter sites. In spite of this, many of the flies will remain on the beds during warm, calm weather, when conditions are specially favourable to egg-laying.

This habit of the flies of avoiding windy positions means that the choice of site should be to arrange the beds in open positions and away from hedges, close fences, weed beds, coarse herbage, and from a Potato crop. Some allotment-holders have found it advantageous to sow several isolated rows of Carrots dispersed among other crops in preference to a number of consecutive rows.

Sowing Carrots near hedges may be unavoidable, in which case a southern rather than a northern or western aspect should be chosen, so that the dispersal of the flies from their shelter will be down-wind.

A further disadvantage in the proximity of hedges (especially Privet and Elm) to the beds is the competition for water that arises between the crop and the neighbouring hedge plants. The roots of such hedges are so greedy of moisture that they extend far into the adjoining beds, causing the Carrots, especially when young, to wilt and to be affected to a greater degree by comparatively light infestations of fly.

Preventive and Remedial Measures.—Under this heading will be discussed the effect of (i) dates of (a) sowing and of (b) harvesting, (ii) cultivation, and (iii) sprays and repellents upon the incidence of the pest.

(i) (a) *Date of Sowing.*—Five varieties of Carrots were sown at nine fortnightly intervals from the end of March to the third week in July for three years (1942–44), and it was clearly demonstrated that at no period was the crop free from attack by either the first and/or second generation of flies. Sowings made from the end of March or early April to the third week in June resulted each year in the same general intensity of attack, which progressively decreased on Carrots sown from the end of June to the third week in July. The latest sowings, though far less attacked, are often too immature to be of value unless the crop is grown under exceptionally favourable conditions.

The earliest sown Carrots are liable to attack by the whole of the first generation of flies. The later May sowings escape injury to some extent by the first-brood larvæ, while those sown in June will normally escape serious injury by the first generation, but are liable, later, to attack by the earlier-emerging second-brood flies. The population of second-generation flies will depend upon the extent to which early-sown crops have been grown in neighbouring gardens and allotments, and upon the incidence of the pest upon such crops.

Weather conditions affect the degree of attack on all sowings throughout the season, and this is due not only to the effect that climate has upon the length of period over which the flies emerge, upon their dispersal and upon their movements from shelter sites to the beds, but also upon the state of growth of the seedlings and the rate at which they reach their rough-leaf stage, when they are relatively more attractive to the egg-laying females.

A threatened early attack may often be arrested by watering or irrigation, especially during a period of drought.

To reduce singling to a minimum or, preferably, altogether by sowing thinly is advisable. The flies are readily attracted to Carrot rows by the odour of the crushed foliage and to the loosened soil around the seedlings.

When singling is necessary, the operation should be completed before the seedlings reach their second rough-leaf stage, and to delay until later will invariably result in a heavier attack. Observations at Wisley confirm those made elsewhere (4, 5) that the number of eggs laid around Carrots increases with the size of the foliage.

The thinnings should always be removed and not left on the beds, and the operation carried out during the earlier hours of the day to escape the peak period activities of the flies. After singling, the soil along the rows should be consolidated by firm treading or by drawing the soil up to the roots in a manner of partial earthing-up. A further consolidation of the soil around the seedlings by a thorough watering is advisable. In the case of light attacks, the infested seedlings should be carefully lifted and burned, for the eggs are seldom distributed evenly and equally over the bed. The maggots will move along a row of very young seedlings in the manner of Onion Fly larvæ in spring-sown seedling Onions (3).

(i) (b) *Date of Harvesting*.—The earlier (*i.e.* mid-October) lifting of a Carrot crop avoids further deterioration of the roots from the larvæ of the second generation, and to delay harvesting until November may result in a substantial increase of damage not only from the maggots but from frost.

The majority of the larvæ leave the attacked roots and pupate in the soil nearby in late winter or early spring.

All heavily attacked roots should be fed to animals, and should never be clamped or dug in.

The weight of crop is dependent upon the date of sowing and upon climatic factors. While one may expect April-sown Carrots to give the highest yields, which will progressively decrease as the season advances, this will depend upon weather conditions. A period of drought during the earlier stages of growth may so affect the plants that complete recovery from the check is not possible. Watering and overhead irrigation during such periods will tend to counteract any such check and may even arrest an attack of fly.

(ii) *Cultivation*.—A series of experiments was designed to observe

the effect of allowing Carrots to grow without any disturbance from singling, hand-weeding or hoeing—the element of attraction in the nature of bruised leaves and soil disturbance during such operations being eliminated. While the weed-ridden bed served as shelter for the flies, fewer eggs were laid than on plants growing in an adjoining cultivated bed. The general incidence of attack on the May–July sowings was far lower, for by that time the weed growth provided ground cover for the Carrots.

The advantages of such a method are counterbalanced by the fact that Carrots grown as unsingled plants and with a weed cover suffer more severely during periods of drought owing to the competition that exists between the crop and the weeds, so that what is gained in quantity (*i.e.* yield) is lost in quality (*i.e.* size of roots).

(iii) *Sprays and Repellents*.—The successful avoidance of Carrot Fly under commercial conditions by the application of a poison mixture consisting of 0.8 per cent. sodium fluoride and 2.5 per cent. cane molasses in water to the herbage of dike-sides and to headlands bordering Carrot fields has been proved (4, 5). Success with this method is dependent upon correct timing both in regard to the emergence dates of the first generation of flies and to the time of day when such applications are made.

The hedges surrounding one Carrot bed at Wisley were sprayed ten times (May 20–June 29) against first-generation flies and eight times (August 10–September 9) against those of the second generation. The results were not satisfactory, and the chief reasons against recommending the adoption of this method under conditions prevailing in gardens and allotments are: (i) the somewhat poisonous nature of the bait; (ii) the number of applications that are required to effect any marked reduction in first-generation flies—the amateur being highly critical of method that requires a number of sprayings against any one pest and exact timing in such applications; (iii) the injury that may follow its application to the foliage of hedges and of adjoining crop plants (*e.g.* Potato); and (iv) the cancelling-out of its effectiveness where there exist alternative shelter sites for the flies.

Other methods, chiefly indirect in the form of repellents, have been investigated (5), including creosote, naphthalene, grass cuttings with and without the addition of 4 per cent. calomel dust, and soot, all of which will give some measure of control of moderate attacks. The effectiveness of these treatments is increased by renewal of the active agent from time to time.

The use of creosoted string or twine stretched immediately above and along the rows of seedlings, beginning in early May and renewed at three fortnightly intervals, is an excellent method of avoiding damage and was clearly demonstrated in certain London Parks in 1943—a year of extremely severe outbreaks. Further treatments should be given for maincrop Carrots at four fortnightly intervals commencing in early August. Success will depend upon the renewal of the creosote at intervals, upon the nature of the string and its absorbent qualities, and upon the height it is erected over the plants.

The application of whizzed naphthalene dusted along the rows at the rate of 1–1½ oz. per yard run of row, and at three 10–14-day intervals commencing immediately after singling, will considerably lessen the chance of an outbreak.

The effect of such repellents, however, is to deter the female flies from egg-laying. This is only accomplished by renewal of the re-

pellent agent from time to time, owing to the somewhat rapid vaporization that occurs during high temperatures.

Varietal Susceptibility to Attack.—While there appeared to exist some evidence that one variety of Carrot, namely, 'Early Nantes,' out of the five varieties grown in the Wisley trials exhibited a slight degree of "resistance" or "tolerance" to attack, the differences in the degree of infestation were not sufficiently marked to render them significant.

General Recommendations for the Avoidance of Carrot Fly.

Choose a fresh site each year for the Carrot crop.

Avoid applications of fresh organic manure to the chosen site unless such dressings are placed at the bottom of the first spit.

Sow thinly to reduce singling to a minimum.

Remove singlings from the bed immediately after thinning.

Consolidate the soil along freshly singled rows by treading and by a heavy watering.

Use a repellent (creosoted string or naphthalene) immediately after singling, and renew at least three times at 10-14-day intervals.

Delay date of sowing early crops until late May or early June to escape damage by first generation of flies, and defer main sowing until July.

Sow in open and windswept positions and away from hedges, Nettle and weed beds, Potato crops and other shelter sites.

Sow, if preferred, isolated rows between other crops, but avoiding Potatoes.

Avoid frequent disturbance of the soil around the roots by reducing hand-weeding within the rows to a minimum.

Lift and clamp the crop in October to avoid both frost injury and a substantial increase of damage by maggots of the second generation.

Allow poultry (if possible) free run of ground after crop is lifted.

Feed heavily infested roots to animals (poultry, pigs or rabbits).

Refrain from digging in attacked roots, thereby avoiding an increase of the fly population the following season.

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- (4) PETHERBRIDGE, F. R., WRIGHT, D. W., and DAVIES, P. G.: *Ann. App. Biol.* **29**, 380-92 (1942).
- (5) PETHERBRIDGE, F. R., and WRIGHT, D. W.: *Ann. App. Biol.*, **30**, 348-58 (1943).

NARCISSI AT WISLEY, 1942-44.

THE trial of one hundred and nine varieties was planted in the autumn of 1942 on the western side of Battleston Hill. Twenty-five bulbs of each variety were given the warm water treatment before planting to ensure that neither eelworms nor the larvae of Narcissus flies should interfere with their growth, and on the whole the varieties made satisfactory clumps. The trial beds were covered each year with tiffany to avoid attack by the large Narcissus fly, *Merodon equestris*, from the third week in May to mid-July.

The trial was inspected several times during each spring by the Narcissus and Tulip Committee, and final judgment was given in the spring of 1944, and the report indicates the Committee's recommendations for Awards, also the present state of the trial—varieties included for future judgment—varieties retained for comparison, against which newcomers are judged—varieties deleted from the trials.

DIVISION 1A.

Decency (raised and sent by Messrs. van Deursen, Sassenheim, Holland), **F.C.C.** April 4, 1944.—See **R.H.S. JOURNAL 61**, p. 302. (**A.M.** 1936.)

The following varieties have been included in the trial for future judgment : **GODOLPHIN** (Williams) ; **KANDAHAR** (G. L. Wilson) ; **LA GARRON** (G. L. Wilson) ; **LA PRINCIPAL** (G. L. Wilson).

The following varieties have been retained for comparison : **BRANDON** (**A.M.** 1936) ; **CHARLES I** (**A.M.** 1939) ; **DANDY BOY** (**H.C.** 1936) ; **GOLDEN RAY** (**H.C.** 1939) ; **MAXIMUS SUPERBUS** (**C.** 1936) ; **MUSKETEER** (**A.M.** 1941) ; **SOLFERINO** (**A.M.** 1936) ; **SULPHUR** (**A.M.** 1936) ; **SULPHUR PRINCE** (**A.M.** 1939) ; **WORLINGTON** (**A.M.** 1939) ; **WRESTLER** (**A.M.** 1936) ; **YELLOW BEAUTY** (**H.C.** 1936).

DIVISION 1B.

Mrs. E. H. Krelage (raised by Messrs. Krelage and sent by Messrs. de Graaff-Gerharda, Lisse, Holland). **A.M.** April 26, 1944.—See **R.H.S. JOURNAL 61**, p. 304. (**H.C.** 1939.)

The following varieties have been retained for comparison : **PACIFIC** (**H.C.** 1936) ; **ROXANE** (**A.M.** 1936).

The following variety has been deleted from the trials : **ESKIMO** (**C.** 1936).

DIVISION 1C.

The following varieties have been included in the trial for future judgment : **BOSWIN** (Williams) ; **FINGAL** (Bath) ; **GLENRAVEL** (G. L. Wilson).

The following varieties have been retained for comparison : **BAMBOULA** (**C.** 1936) ; **Mrs E. C. MUDGE** (**A.M.** 1936).

DIVISION 2A.—INCOMPARABILIS.

Jubilant (raised and sent by the late Mr. P. D. Williams, St. Keverne, Cornwall). **F.C.C.** April 6, 1944.—See **R.H.S. JOURNAL 61**, p. 306. (**A.M.** 1936.)

The following varieties have been included in the trial for future judgment : **BOKHARA** (Williams) ; **CARBINEER** (Farrow) ; **CHEERIO** (Williams) ; **CROCUS** (Williams) ; **FORTUNE** (Bath) ; **MARKSMAN** (Williams) ; **ORANGE BIRD** (Barr) ; **WHITELEY GEM** (Bath).

The following varieties have been retained for comparison : **AMBULE** (**A.M.** 1936) ; **BUTTER BOWL** (**H.C.** 1936) ; **COVERACK GLORY** (**H.C.** 1936) ; **GARIBALDI** (**A.M.** 1936) ; **HAVELOCK** (**F.C.C.** 1936) ; **HELIOS** (**A.M.** 1936) ; **ST. IVES** (**A.M.** 1939) ; **KILLIGREW** (**A.M.** 1936) ; **NIMROD** *syn.* **CARLTON** (**F.C.C.** 1939) ; **PEPPER** (**C.** 1939) ; **RED DEFIANCE** (**A.M.** 1936) ; **TREASURE** (**C.** 1936) ; **YELLOW BIRD** (**A.M.** 1936) ; **YELLOW POPPY** (**H.C.** 1936).

The following varieties have been deleted from the trial : **BONAPARTE** (**H.C.** 1936) ; **GOLDEN FRILLED** (**C.** 1936) ; **LUCINIUS** (**A.M.** 1936) ; **MALVERN GOLD** (**H.C.** 1939) ; **MARENTHA** ; **SMEROE** (**A.M.** 1936) ; **VELVETEEN**.

DIVISION 2B.

The following varieties have been included in the trial for future judgment : **BODILLY** (Barr) ; **FAVELL LEE** (Meyer) ; **LESLIE HULBERT** (Meyer) ; **NISSA** (Barr) ; **ORANGE CRINGLINE** (Pearson) ; **ZEELAND** (Farrow).

The following varieties have been retained for comparison: EVA (A.M. 1936); FOLLY (F.C.C. 1936); GLENCOE (C. 1941); MARIAN CRAN (A.M. 1936); REWA (H.C. 1936); SIMLA (C. 1936); WARLOCK (F.C.C. 1939).

DIVISION 3A.—BARRII.

The following varieties have been included in the trial for future judgment: LUCCOMBE (Williams); MARKET MERRY (Williams); TREDORE (Bart).

The following varieties have been retained for comparison: GULLIVER (C. 1941); NANNY NUNN (H.C. 1936); DINKIE (A.M. 1936).

DIVISION 3B.

Prince (introduced by Messrs. A. T. van Graven, and sent by Messrs. R. H. Bath, Ltd., Wisbech, Cambs.). A.M. April 26, 1944.—See R.H.S. JOURNAL 67, p. 104. (H.C. 1941.)

The following varieties have been included in the trial for future judgment: ARCADIA (Bath); SANDRINGHAM (Bath); SUNSTAR (Williams); TURIN (Williams).

The following varieties have been retained for comparison: MING (H.C. 1936); SUNRISE (A.M. 1936).

DIVISION 4A.—LEEDSII.

Sea Shell (raised by Mr. G. H. Engleheart and sent by Mr. W. B. Cranfield, East Lodge, Enfield Chase, Middlesex). A.M. April 26, 1944.—See R.H.S. JOURNAL 61, p. 311. (H.C. 1936.)

The following varieties have been included in the trial for future judgment: BRUNSWICK (Williams); DENYS MEYER (Meyer); EDRIC (Bath); FLOORE (Thornton).

The following varieties have been retained for comparison: CICELY (A.M. 1936); GIRDLE (H.C. 1939); GRAYLING (A.M. 1936); HERA (A.M. 1936); MARMORA (F.C.C. 1936); MAY (C. 1936); MILKMAID (H.C. 1936); MITYLENE (A.M. 1936); SNOW QUEEN (A.M. 1939); TUNIS (F.C.C. 1936); WHITE DELIGHT (C. 1936); WHITE MAIDEN (H.C. 1936).

The following varieties have been deleted from the trials: BRYN ELLEN; STOLBERG (H.C. 1936).

DIVISION 4B.

The following variety has been included for future judgment: SILVER CIRCLE (Johnstone).

DIVISION 5A.—TRIANDRUS HYBRIDS.

The following varieties have been included for future judgment: HAPPY EASTER (Bath); RIPPLING WATERS (Bart).

The following variety has been retained for comparison: NIVETH (H.C. 1936).

DIVISION 5B.

The following variety has been deleted from the trial: JOY BELLS.

DIVISION 6.—CYCLAMINEUS HYBRIDS.

The following variety has been included for future judgment: BARTLEY (Stern).

The following varieties have been retained for comparison: BERYL (A.M. 1936); FAIRY WINGS (C. 1941); ORANGE GLORY (A.M. 1936).

DIVISION 7.—JONQUIL HYBRIDS.

Golden Perfection (raised and introduced by Messrs. de Graaff Bros., Ltd., and sent by Messrs. Farrow and Sons, Holbeach, Lincs.). A.M. April 26, 1944.—See R.H.S. JOURNAL 67, p. 105. (H.C. 1941.)

The following varieties have been retained for comparison: **AURELIA** (A.M. 1936); **GOLDEN SCEPTRE** (F.C.C. 1936); **HELSEA** (A.M. 1936); **LANARTH** (F.C.C. 1936); **TREVITHIAN** (F.C.C. 1936); **YELLOW PRIZE** (A.M. 1936).

DIVISION 8.—TAZETTAS.

The following variety has been included for future judgment: **BETHA** (Bath).

The following varieties have been retained for comparison: **GLORIOUS** (A.M. 1936); **SCARLET GEM** (F.C.C. 1936); **WHITE'S HYBRID** (A.M. 1939).

The following variety has been deleted from the trial: **OWL**.

DIVISION 9.—POETICUS VARIETIES.

Sarchedon (raised by Mr. G. H. Engleheart and sent by Messrs. de Graaff-Gerharda). A.M. April 26, 1944.—See R.H.S. JOURNAL 61, p. 315. (H.C. 1936.)

The following varieties have been included for future judgment: **ACTAEA** (Bath); **YPSILANTE** (Bairt).

The following variety has been retained for comparison: **FAIR LADY** (H.C. 1936).

The following varieties have been deleted from the trials: **CRUSOE** (H.C. 1936); **CAEDMON** (H.C. 1939); **LAMPLIGHTER**.

DIVISION 10.—DOUBLE VARIETIES.

Feu de Jole (raised by Mr. W. F. M. Copeland and sent by Messrs. R. H. Bath, Ltd.). A.M. April 6, 1944.—See R.H.S. JOURNAL 61, p. 315. (H.C. 1936.)

Mrs. William Copeland (raised and sent by Mr. W. F. M. Copeland, Sabi Lodge, Woodlands Road, Ashurst, Southampton, Hants.). A.M. April 26, 1944.—Flowering from April 5 to April 26, 1944. Vigorous with a stiff 18-inch stem above the foliage. Flower $3\frac{1}{2}$ inches diameter; perianth segments $1\frac{1}{2}$ inch long, flat, creamy-white; coronal segments $1\frac{1}{2}$ inch deep. Canary Yellow (H.C.C. 2/3). Flowers 6 in 1942, 19 in 1944 from six bulbs.

The following varieties have been retained for comparison: **BUTTERMILK** (H.C. 1936); **CHEERFULNESS** (F.C.C. 1939); **MARY COPELAND** (A.M. 1936).

The following variety has been deleted from the trial: **MILK AND HONEY** (C. 1936).

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Part 4

April 1945

THE SECRETARY'S PAGE.

Changes of Address.—Fellows and Associates are reminded that unless a change of address is received within the first week of the month, the JOURNAL of the following month will be sent to the old address. So many complaints come that the JOURNAL does not go to the right address, but it is always traced to the fact that the change of address is received after the wrappers have passed from the addressograph to the distributors.

Programme of Meetings.—The Annual General Meeting was held on February 20, and an account of the President's address will be found in the Proceedings.

Daffodil competitions will be included in the Meeting and Show to be held on April 17 (12.30 P.M. to 5 P.M.) and April 18 (10 A.M. to 5 P.M.), and the schedule for these competitions can be obtained from the Secretary.

A lecture on "Daffodils" will be given by Mr. E. A. Bowles, Vice-President of the Society, at 2.30 P.M., on Tuesday, April 17, in the Lecture Room of the New Hall.

In May there will be the following Meetings with Shows :

May 1 (12 noon to 5 P.M.)

May 29 (12 noon to 5 P.M.)

May 15 (12 noon to 5 P.M.)

May 30 (10 A.M. to 5 P.M.)

May 31 (10 A.M. to 5 P.M.)

On May 1 there will be competitive classes for Rhododendrons, and on May 15 for Flowering Trees and Shrubs. The schedules for these competitions can be obtained from the Secretary.

On May 1 there will be a lecture on "Rhododendrons" by Mr. J. P. C. Russell, at 2.30 P.M. in the Lecture Room of the New Hall. A lecture on "Some Rare Alpines" will be given by Dr. Giuseppi on

May 15, in the Lecture Room at 2.30 P.M., and on May 29 Miss Pesel will lecture on "Iris for the Little Garden," also at 2.30 P.M. in the Lecture Room of the New Hall.

Demonstrations at Wisley.—There will be no demonstrations at Wisley during the month of April, but the following two demonstrations will be held during May :

Vegetable Garden.

May 2, 3	Control of Vegetable Pests and Diseases	2-4 P.M.
May 16, 17	Thinning, Transplanting and Successional Cropping	2-4 P.M.

Fellows and Associates who desire to attend are requested to notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey. Particulars of how to get to Wisley were given in the January JOURNAL.

Queen's Institute of District Nursing Gardens Scheme.—We are asked by the Queen's Institute of District Nursing to call attention to the following :

" GARDENS SCHEME.

" Do not miss visiting the many gardens that have kindly promised to open under the Queen's Institute of District Nursing Gardens Scheme during the coming spring and summer for the benefit of district nursing. Lists can be obtained from the Gardens Secretary, 57 Lower Belgrave Street, London, S.W. 1."

The Society's Examinations.—The written examination for the National Diploma in Horticulture will take place on Saturday, April 14.

WISLEY IN APRIL.

FLOWERS are so numerous this month that something of interest is to be found in every part of the Gardens. Some outstanding features will be the earlier Rhododendrons and Japanese Cherries, flowering Crabs, Forsythias, Camellias and other choice trees and shrubs, Daffodils and the varied collection of saxatile plants maintained in the Rock garden and Alpine house.

From the very beginning of the month, if the weather be favourable, there will be a succession of Rhododendrons lasting until after mid-summer. The larger number, both of species and hybrids, are planted on the slopes of Battleston Hill, easily reached by way of the broad grass walk leading southward from the Rose garden. Large groups of some of the smaller-flowered species, such as the lilac or mauve *R. rubiginosum*, the primrose *R. lutescens*, and *R. racemosum*, varying from blush to bright pink, at once attract the eye, as do large specimen plants of *R. arboreum roseum*, *R. planetum* with fine trusses of clear rose bells, *R. Fargesii*, and *R. fulvum*, whose blush flowers are supported by dark, russet-felted foliage. Richer colour is supplied by *R. Thomsonii* of blood-red and the intense scarlet *R. neriiflorum* and *R. euchaites*. Later in the month many of the hybrids will be in bloom. The collection in the Wild garden includes larger specimens of *R. arboreum*, *R. campanulatum*, the blue-purple *R. niveum* and *R. Falconeri*, the last-named now about 8 feet high and flowering freely for the first time. Not less interesting, although less showy, are the lovely primrose

R. Wardii, the vivid purple, pale-leaved *R. reticulatum*, *R. Williamsianum*, lightly set with pendent, rosy bells, and *R. repens*, with brightly glowing flowers at ground level.

Some other noteworthy shrubs to be seen now in the Wild garden are the varieties of *Camellia japonica*, *Magnolia Soulangeana* with large, goblet-shaped, pink- or purple-flushed flowers, and *Pieris taiwanensis*, carrying long, spreading racemes of pearly-white bells. *Enkianthus perulatus* is another attractive Ericaceous shrub, distinct from others of the same genus and quite outstanding in its autumnal colouring. *Chamaedaphne calyculata*, also a member of the same family, is widely distributed in the higher latitudes of the Northern Hemisphere, and forms a dense bush of wiry, arching, white-flowered branchlets.

Much of the charm of this part of the garden is due to the host of small herbaceous plants naturalized here. Following the Crocuses, Chionodoxas and Narcissi there now appear drifts of the coloured forms of *Anemone nemorosa* and *A. apennina*, the frail, fleeting *Isopyrum thalictroides* and blue and white Wood Violets together with the tiny yellow *Viola eriocarpa*. *Primula denticulata* grows everywhere along the sides of ditches, and here and there patches of Trillium, Erythronium and Snake's Head Fritillary rise above a mossy carpet. In secluded spots one may find Shortias, both the N. American *S. galacifolia* and the larger-flowered Japanese *S. uniflora*, as well as the related *Schizocodon soldanelloides* and *S. macrophyllus*, all with glossy, ever-green leaves and fringed flowers; *Epigaea repens* with pale, fragrant blossoms on creeping shoots; *Soldanella montana* and *S. alpina*, both long established in the shade of a thicket of Skimmia.

On the hill, above the Floral Trial ground, the earlier Japanese Cherries, *Prunus yedoensis*, *P. Sargentii* and *P. serrulata* var. *semperflorens*, will probably be opening during the first week of April, continuing the bright display of the handsome, large-flowered Almond known as *Prunus Pollardii*. These are soon followed by the equally popular double varieties of *P. serrulata* and by the coloured Crabs. Many more of these indispensable flowering trees are to be seen in Seven Acres, where *Forsythia spectabilis*, the Flowering Currants *Ribes sanguineum* and *R. aureum*, several varieties of Japanese Quince, *Erica australis* and *E. mediterranea* combine with other shrubs of merit to form a colourful picture of which not the least striking feature is the group of Weeping Willows beside the pond, brightly clothed in palest green. From here, a pleasant five-minute walk may be taken either through the Pinetum or by a path beside the River Wey to Howard's Field, where, by the end of the month, the first of over a hundred different Lilacs will be in flower. Here, too, are many other ornamental shrubs and deciduous trees either coming into young leaf or, like the several species of Alder, hung with long, coloured catkins.

The Rock garden is rapidly becoming brighter, but the greatest mass of blossom is supplied by the small-flowered Rhododendrons massed near the ponds and effectively associated with *Narcissus Bulbocodium* and other small Daffodils in the Alpine meadow. In the Bog garden the golden spathes of *Lysichiton americanum* and the more graceful white ones of *L. camtschaticense* are appearing in advance of their leaves, together with the single and double Marsh Marigolds and the rosy heads of *Saxifraga peltata*. The Hawthorn-scented twin sprays of *Aponogeton distachyon* have already made an appearance in the ponds, and *Primula rosea* is flowering on the moist banks nearby. In the higher and drier parts of the Rock garden broad patches of

colour are formed by *Saxifraga oppositifolia*, *S. apiculata* and others, *Pulmonaria angustifolia* of deep blue, *Omphalodes nitida* of a more vivid tone, and *Euphorbia epithymoides* with clustered, leafy growths of greenish-yellow. Other plants of interest are *Primula juliae*, *P. Sieboldii*, *Anemone Pulsatilla* and its varieties, including the good pink 'Mrs. Van der Elst,' and *Polygala chamaebuxus*, a pretty sub-shrub with white and yellow, or sometimes purple-winged, flowers.

The Alpine house, completely filled with good things, has reached its most floriferous period. Among the plants which deserve special mention are *Daphne petraea* and its variety *grandiflora*, forming fragrant, flower-covered hummocks, and the similar *D. arbuscula*, *Celsia acaulis*, of Primrose-like habit and bright yellow Mullein flowers, *Erigeron uniflorus*, covered with lavender Daisy-heads on 4-inch stalks, *Primula Rockii* with golden, fringed blossoms nestling among aromatic leaves, and *Ranzania japonica*, like a somewhat larger edition of the related *Plagiorhegma dubium*, with equally delicate, fugacious flowers. The smaller Ericaceous shrubs repay close examination, and the collection includes several species of Cassiope, with comparatively large, white bells suspended on thread-like stalks, the Heath-like species of Phyllo-doce with bluish or white blossoms, and *Arctica nana* with racemed florets on a bush 2 or 3 inches tall. The minute *Androsace pyrenaica*; *Chrysanthemum* (or *Leucanthemum*) *Catananche*, *C. atlanticum* and *C. demnatense*, a distinguished trio from N. Africa; and *Lithospermum oleaeifolium* are a few other plants of more than ordinary interest.

GARDEN WORK.

REMINDERS FOR APRIL.

As soon as the various winter green crops cease to be productive remove the stumps and prepare the ground in readiness for successive crops. It is a good plan to lift the remaining Leek crop and "heel in" in a semi-shady position.

Vegetable Garden.—Where it is intended to form new Asparagus beds the present is a good time for planting, but the ground should have been deeply dug and well manured previously. It is also time to sow Asparagus seeds to raise plants for planting in one or two years' time. Periodically examine established beds for the purpose of gathering the crop in the right condition.

In a nursery seed-bed during the first week make a further sowing of Brussels Sprouts for late supplies, also one of Cauliflower 'All the Year Round.' About the third week sow all varieties of Broccoli (heading), Cauliflower 'Autumn Giant,' also Cabbages and Savoys for autumn and winter cutting. During the last week sow Broccoli (sprouting) and Kales for winter and spring supplies.

Conditions being favourable, a limited sowing of Globe Beetroot and Turnip 'White' or 'Red Milan' can be made in the early part of the month, also a first sowing of Cos Lettuce. About the middle of the month make a sowing of Onion 'Silver Skin' (for pickling) on ground which is not too rich.

Make successional sowings of a stump-rooted Carrot, also Peas during the first week, a suitable variety of Cabbage Lettuce in the second week and, towards the end of the month, one of Spinach and

Cos Lettuce. Continue to make sowings of Radishes about every ten days.

Some of the lesser known vegetables which can be sown this month include Salsify, Scorzonera and Cardoons, the latter towards the end of the month. Many garden herbs can be raised from seeds sown in the open this month.

Have sticks in readiness and stake Peas when the seedlings are about 2 inches high; a few twigs placed among the seedlings will assist them to reach the sticks.

Immediately the rows of Broad Beans, Peas, Onions and other seedlings can be seen hoe between the rows. As soon as Lettuce and Spinach seedlings have true leaves thin, in the first instance, to 2 inches apart and later to the required distance.

Fruit Garden.—All newly planted fruit trees, especially those planted during the past three months and those growing against walls, should receive a mulch of strawy manure or similar material in order to conserve the moisture in the soil.

Fruit trees which were planted during the past three months should also be pruned as soon as possible. Shorten the leading shoots by at least one-half in order to lay a good foundation for the main branches of the tree.

The first half of the month is usually the best time for grafting and, where it is intended to carry out this operation, endeavour to complete it before the flow of sap becomes too strong.

Weather conditions are often very dry when Apricot, Cherry, Plum, Peach and Nectarine trees bloom. When these conditions obtain, in order to assist in "setting" the fruit in the case of trained trees in restricted form, it is advisable, immediately the flowers expand, to mist the trees lightly with tepid water applied with a syringe about noon each day during the period while the flowers remain fresh.

During the present month it is advisable to carry out a spraying programme for the control of Apple and Pear Scab, also Caterpillars.

Flower Garden.—To provide plants for planting out at a later date to flower next year, seeds of many hardy herbaceous perennials, such as Delphiniums, Lupins, etc., may be sown, either in a cold frame or prepared beds in the open.

Sow such annuals as Clarkia, Godetia, Lavatera, Mignonette, Viscaria, etc., where they are to bloom; sow the seeds moderately thinly and cover lightly. Thin before the plants become crowded.

Sweet Peas raised in pots or boxes from seeds sown last autumn can be planted, early in the month, on ground which has been previously well prepared. Support the young plants immediately with short twiggy sticks and provide a little brushwood as protection until the plants become established.

This is a good time to plant, or transplant, all kinds of evergreens and bamboos; water thoroughly at planting time and, should the subsequent weather prove dry, spray the foliage each evening as required. Hardy Heaths transplant well in early April, also Water Lilies towards the end of the month, when this operation is considered necessary. The present is a good time to plant Clematis from pots; also, if not already completed, continue to plant Gladiolus and Montbretias.

Give timely support to Herbaceous plants immediately they require it. Delphinium plants are amongst the earliest to need staking.

As soon as the flowers fade, if desired, such early flowering shrubs as Forsythia, *Ribes sanguineum*, *Prunus triloba plena*, and *Spiraea arguta*

can be pruned by cutting the flowering shoots back to within two or three buds of the old wood.

Watch for Aphis attacks on a variety of plants, especially Roses, and when discerned spray at once with a Nicotine Wash or liquid Derris.

Unheated Greenhouses and Frames.—As frames are cleared of plants which have overwintered, make up a suitable compost and transplant direct into the frames vegetable and flower seedlings as they become large enough.

For providing plants for planting in the garden in early June, seeds of Tomatoes are usually sown in slight heat about April 10, alternatively seeds can be sown in a cold house or frame about April 1; in this case endeavour to maintain the temperature, as far as possible, at approximately 55° to 60° F. by controlling the ventilators to husband the sun's heat.

Celery for late supplies can be sown early in the month, and about the end of the second week sow, in pots or boxes, seeds of Dwarf and Runner Beans, Marrows, Sweet Corn and Ridge Cucumbers for planting out in the garden when all danger of frost is past.

For planting in the garden when large enough, sow in boxes containing a suitable compost, seeds of Aster (China), Marigold (African and French), Chrysanthemum (annual), Zinnia, etc., and place in a greenhouse or frame to germinate.

Begonias for bedding out may be "started" in a greenhouse or frame early in the month. Plunge the tubers in boxes containing peat or leaf-mould, but do not cover them.

Plants of Onions and early maturing Cabbages and Cauliflowers, raised from seeds sown in frames during February, should be hardened off and planted out in the garden about the middle of the month.

To supply flowering plants for next winter take runners from Violets growing in frames and plant on a north or east border where a liberal supply of leaf-mould has been dug in.

As soon as the young growths on the Grape Vines are about 1 inch in length reduce the number on each spur to the two strongest and cease syringing. Keep the border and all floor space moist by damping down about mid-day on sunny days, endeavouring to avoid surplus moisture at nightfall.

Immediately the flowers fade on Peach and Nectarine trees syringe the trees with water about mid-day during sunny periods. When the young green growths are about three-quarters of an inch in length gradually reduce their number; carry out this operation (known as disbudding) at about ten-day intervals. During the first thinning remove the weakest and badly placed growths, taking care to retain the best placed one nearest the base of the shoot (from which the short growths arise), also the one at the apex.

THE ORIGIN OF APPLE 'BRAMLEY'S SEEDLING.'

By A. SIMMONDS.

ACCORDING to the 1944 Fruit Census, of the 6½ million trees of cooking Apples in commercial plantations in England and Wales, more than one-third consist of 'Bramley's Seedling'; and, speaking of the variety at a conference of fruit growers at Maidstone last autumn, Dr. H. V. TAYLOR, then the Ministry of Agriculture's Commissioner for Horticulture, said: "It is one of the finest cooking apples in existence in this or any other country and now stands supreme in all British markets."

This outstanding Apple appears to have been first exhibited before the Society's Fruit Committee on December 6, 1876, when, according to the *Gardeners' Chronicle*, "Mr. Merryweather, nurseryman, Southwell, Notts, showed a new kitchen apple, named Bramley's Seedling, which was highly commended." Seven years later, at the Apple Show held by the Society in its gardens at Chiswick in October 1883, the variety received a First Class Certificate, and in a report of the Show in the *Gardeners' Chronicle* for October 13 of that year we read: "Among the new or little-known sorts brought to the front . . . perhaps one of the very best is a seedling raised at Southwell, Notts, by a shoemaker, named Bramley, and called Bramley's Seedling by two exhibitors, Mr. H. Merryweather, of Southwell, and Mr. H. Bradley, of Hallam [*sic*], near that town, both of whom showed fine examples."

The statement that the variety was raised "by a shoemaker, named Bramley" was in accordance with the information supplied by Mr. H. MERRYWEATHER at that time, and it has been repeated in various books and numerous articles, and until recently there seems to have been little if any evidence that anyone outside Southwell had ever suspected the truth, viz. that BRAMLEY did not raise the Apple and was not a shoemaker.

My own suspicion that there was something wrong with the orthodox story was aroused by a letter in the *Gardeners' Chronicle* for January 2, 1943, from Mr. H. H. GRACE, of Norton Hall Gardens, Sheffield, who stated that the seedling was raised by a Miss BRAILSFORD. I accordingly corresponded with Mr. GRACE and with Messrs. MERRYWEATHER & SONS with a view to ascertaining the facts. It presently appeared, however, that Mr. L. LEFROY, who, through the exigencies of the war, has been residing near Southwell, had been interesting himself in the origin and preservation of the original tree, and in August 1944 he sent to the Editor a note upon the matter for publication in this JOURNAL. In the accompanying letter Mr. LEFROY explained that the historical part of the note was based almost entirely upon verbal statements of local inhabitants, and I therefore suggested that it would be worth while to ascertain as far as possible, once and for all, whether the local tradition was supported by documentary evidence. Mr. LEFROY very kindly fell in with the suggestion and has, with infinite pains and a judicial mind, gathered and sifted a mass of evidence of which the following is a brief summary. Mr. LEFROY has very kindly deposited his detailed notes and correspondence in the Lindley Library where they will be preserved.

The Mr. MERRYWEATHER who first exhibited 'Bramley's Seedling'

and distributed it far beyond its place of origin was Mr. HENRY MERRYWEATHER (1839-1932), the son of the founder of the business of Messrs. H. MERRYWEATHER & SONS, and the father of its present senior partners, Messrs. HENRY and ALFRED MERRYWEATHER. The latter both recall frequent recitals by their father of his first acquaintance with this Apple. About the year 1856, he, then aged about 17, and working in his father's newly established nursery, saw GEORGE MUSSON, gardener to the Rev. ALFRED TATHAM, Vicar Choral or Minor Canon of Southwell Minster, carrying a basket of particularly good-looking Apples from TATHAM's orchard, which almost adjoined the nursery. The outcome of this chance meeting may be gathered from a speech made by Mr. MERRYWEATHER in January 1929, at the age of ninety, on the occasion of his being the recipient of a public presentation, duly reported in the *Newark Herald* under the caption "Southwell's G.O.M." The report runs as follows :

" I [i.e. Mr. MERRYWEATHER] said ' What have you got there ? ' He said, ' Bramley's apple.' I said, ' It looks like a splendid sort,' and he replied, ' It's a very good apple.' I said ' Where does it grow ? ' and he said ' In Mr. Bramley's garden, back of his house.' I went to look at the tree in full fruit. I had not seen the like of it before. I asked for grafts and he said fetch what you want. I then made enquiries about this apple but could not get to hear that the wonder had got away anywhere. I set to work to get up a stock. . . . "

Now on the particular day in 1856 when Mr. MERRYWEATHER met GEORGE MUSSON " carrying a basket of particularly good-looking Apples," MUSSON was coming " from TATHAM's orchard," and while the original tree was growing " In Mr. Bramley's garden," the apples in the basket had been gathered from a tree in TATHAM's orchard, which is now the property of MESSRS. MERRYWEATHER, and the present senior partners knew from their childhood the old tree of ' Bramley's Seedling ' which grew there until it was blown down about 1929. They are satisfied that it had been top-grafted with ' Bramley's Seedling.' So that we see that in 1856, not only was the original tree in Mr. BRAMLEY's garden " in full fruit," but it had been in bearing for a good many years, because the tree in TATHAM's orchard must have been top-grafted several years before 1856, and the top-grafting would not have been done until the original tree had been in bearing sufficiently long to impress the grafter with its merits. In short, in 1856 the original tree in Mr. BRAMLEY's garden must have been much older than ten years from the pip and, indeed, had probably been growing in that garden longer than ten years.

The Mr. BRAMLEY concerned was one MATTHEW BRAMLEY, who was 76 when he died in 1871, and was therefore born in 1795 or 1796. According to the register of his second marriage, his father bore the same Christian name and was a " cordwainer," but there appears to be no evidence that the son ever followed the occupation of a shoemaker. WHITE's *Directory of Nottinghamshire* shows that in 1844 he was the keeper of the White Lion Inn, Easthorpe, Southwell, and a butcher. In 1853, his first wife, ANN SMITH, whom he married in 1823, having died, he married MARY KIRK, and according to the register was then a butcher. Meanwhile, as shown by the title deeds, he purchased what is now known as " Bramley Tree Cottage," Southwell, on November 28, 1846, and, presumably, moving into it sometime *subsequently*, he continued to occupy it until his death in 1871, on

September 22 of which year he was buried at Southwell Minster. It will be observed that he appears to have lived at Bramley Tree Cottage for only ten years before 1856, the year in which the original tree of 'Bramley's Seedling' was brought to the notice of Mr. MERRYWEATHER, and that fact alone would make it doubtful whether BRAMLEY raised the Apple which bears his name.

Now although at various times Mr. HENRY MERRYWEATHER gave BRAMLEY the credit for having raised 'Bramley's Seedling,' and in an advertisement in the Report of our Society's Apple and Pear Conference, 1888, said that the variety was "raised by Mr. M. Bramley," in his own catalogue for 1892, Mr. MERRYWEATHER went into the matter more fully. He there stated that the variety was "a chance seedling from pips sown by a lady named Brailsford in a flower-pot. She planted it out and did not see the fruit. After her death some forty or fifty years ago, the house and garden passed into the possession of a person of the name of Bramley, and this tree fruited in his time." A similar account, omitting the flower-pot, occurs in some of MERRYWEATHER's later catalogues. There is also a local tradition that the original tree came from a pip sown by an ELIZABETH BRAILSFORD, who is referred to sometimes as "Miss" and sometimes as "Mrs.," and is said to have lived in Bramley Tree Cottage before BRAMLEY did so.

These two things seemed to show that the most likely source of a solution of the problem would be the title deeds of the cottage. Upon examination they showed that in 1809 the cottage was transferred to CHARLES BRALESFORD (*sic*) yeoman; that upon his death in 1812 it became the property of his wife, ELIZABETH BRAILSFORD; that when she died, on February 2, 1837, she left it to her daughters, MARY ANN HINDLEY and DIANA ARAM, who sold it in 1838; and that, as already stated, in 1846 it was purchased by MATTHEW BRAMLEY.

In view of the statement in Mr. MERRYWEATHER's 1892 catalogue, coupled with the local tradition, the title deeds seemed to make it practically certain that the lady who sowed the pip from which 'Bramley's Seedling' came was the Mrs. CHARLES BRAILSFORD, who resided at the cottage from 1809 till her death in 1837. But a chance clue led to correspondence with Mr. F. W. HINDLEY (born 1863), of Healing, near Grimsby, and his brother, Mr. CHARLES HINDLEY (born 1859), of Sidmouth, who are grandchildren of MARY ANN HINDLEY (*née* BRAILSFORD). It transpired that their father RICHARD BRAILSFORD HINDLEY (1821-1900) was for many years Deputy Clerk to the County Magistrates at Newark, and that in the early 'seventies he took his elder son, Mr. CHARLES HINDLEY, then a boy, to see the tree behind Bramley Tree Cottage and said, "that is the Bramley Seedling; *my mother planted an apple* in the ground and that is the result"—or words to that effect. It also transpired that Mr. RICHARD BRAILSFORD HINDLEY's other son, Mr. F. W. HINDLEY, recalls frequent statements by his father as to the responsibility of the former's mother for 'Bramley's Seedling,' and in particular Mr. F. W. HINDLEY remembers such a statement being made on the occasion of his parents' golden wedding celebrations in 1894, which included the consumption of an apple pie made from 'Bramley's Seedling' apples supplied by Mr. MERRYWEATHER.

So it would appear that Mr. MERRYWEATHER's "lady named Brailsford" and the "Miss BRAILSFORD" of local tradition, was MARY ANN BRAILSFORD, elder daughter of CHARLES and ELIZABETH

BRAILSFORD, who was baptized at Southwell Minster on May 20, 1791, and who also appears in the Minster's registers as having married, firstly, **JOHN BUCKLOW**, of Newark, on May 20, 1813, and secondly, **RICHARD HINDLEY**, farmer, of Holme, near Newark, on July 26, 1820. It would also appear that as Mr. **MERRYWEATHER** and local tradition agree that the lady's name was **BRAILSFORD**, the pip (or whole apple) was inserted sometime before **MARY ANN BRAILSFORD**'s first marriage in 1813, but after 1809, the year in which she went with her parents to live at what is now called Bramley Tree Cottage, *i.e.* when Miss **BRAILSFORD** was a girl between the ages of 18 and 22. Assuming that the tree took ten years from the sowing of the pip to come into bearing, it would have first fruited between 1819 and 1823, *i.e.* after **MARY ANN BRAILSFORD** had left her original home, but while her widowed mother, **ELIZABETH BRAILSFORD** was still living there. So perhaps the credit of having "raised" 'Bramley's Seedling' should be shared by the daughter who inserted the pip (or whole apple) and her mother who at least refrained from uprooting the seedling during its unprofitable youth, when its ultimate value was questionable.

Bramley Tree Cottage, which has been given its appropriate name by its present owner, Mr. **WILLIAM MOUNTNEY**, is No. 73, Church Street, Southwell, and stands immediately north of the bench-mark 90 in Church Street on the 1919 1/2500 O.S. map. The adjoining "Apiary House," No. 71, is also the property and residence of Mr. **MOUNTNEY**, who attached to Apiary House the greater part of the garden of No. 73. So the original tree of 'Bramley's Seedling,' which is still alive, and was formerly in the garden of No. 73, is now in the garden of No. 71. Mr. **THOMAS COXON** and Mr. **JOSEPH KEETLEY**, born in Southwell in nearby houses in 1865 and 1862 respectively, are both confident as to the identity of the veteran tree, with which they have been familiar all their lives. It fell over about thirty years ago and its condition in 1922 is shown in Fig. 37, which is reproduced through the courtesy of Mr. **W. J. STODDART**.

Unfortunately a hedge which has grown up since 1922 makes it impossible to secure an equally good illustration of the present state of the tree, the trunk of which is in contact with the ground up to a point about 5 feet from its base. At that point the trunk has a girth of 61 inches, and the first limb above it has apparently taken root. At 9 feet from its base the trunk has a girth of 42 inches. The tree is still in good health, with the usual tendency to biennial bearing. Specimens of its fruit were exhibited at our Society's Fruit Conference at the Crystal Palace in September, 1934. Owing to a treasured but overhanging 'Victoria' plum, part of the tree is now too shaded to permit of healthy growth, but surgical attention recently given by Mr. **LEFROY** should, however, prolong its life for many years. A number of large snags have been removed and the surfaces coated with a bituminous preparation. The recumbent trunk is hollow, and on its upper surface contains one large and a number of smaller holes. The edges of the holes have been cut back to live bark and the hollow trunk has been filled with molten crude wax from the oil-wells of the neighbourhood. The molten wax runs into all crevices like water before setting like candle wax, and is covered with a skin of bitumen/asbestos material ("black putty") manufactured for roofing repairs. It is hoped that bark may grow over the wounds, and that this filling treatment will in the meanwhile remain weatherproof.

It is usually stated that 'Bramley's Seedling' was introduced by

Messrs. MERRYWEATHER in 1876, the year in which the variety appears to have been first exhibited in London. It will be remembered that it was in 1856 that HENRY MERRYWEATHER met GEORGE MUSSON with the basket of apples and that the former then "set to work to get up a stock." It seems very unlikely that he would have waited twenty years before selling any trees. Unfortunately, the earliest of HENRY MERRYWEATHER's catalogues now extant is that for 1880, but it seems certain that he listed the variety before 1876; for in his catalogue for 1888 he quotes from a local farmer's testimonial "I have known this variety for 26 years and planted it extensively."

Reverting to MATTHEW BRAMLEY, in spite of a careful search no trace has been found of any issue of either of his marriages.

For almost the whole of the above information I am indebted to Mr. LEFROY, without whose assistance I could not have obtained it, and I tender him my cordial thanks.

MECONOPSIS CHELIDONIFOLIA

THOUGH this *Meconopsis* had been described earlier, WILSON seems to have introduced it from Szechuan in 1904. Why it has made so little progress in gardens one cannot guess, unless it be that, being one of the least demonstrative of a genus rich in many highly ornamental species, it has been overlooked. But to those who do not regard splendour of form and colour as the only recommendation worth encouraging, *M. chelidoniifolia* has its appeal. It is, in the first place, a sound perennial, carrying on indefinitely as a slowly-increasing, low clump of prettily-lobed pale green leaves, bristly on both surfaces with tawny hairs. In spring an established plant will raise a sheaf of erect, slender, sparsely-leaved stems, also hairy and more or less stained with red-brown. These attain a height of 3 or 4 feet, and, branching freely, bear on these hair-fine laterals saucer-shaped blossoms in a limpid citron-yellow and about one and a half inches across. With these airy campaniles of delicately hued blossoms the plant is exceedingly attractive in a light and elegant way and the flowering season prevails for several weeks.

Being too slight in build to support itself, we provide it with a few short peasticks, but in the wild one presumes it flops over naturally as the flowers fade, thus bringing to the soil the vegetative buds said to occur at the axils of the upper stem leaves. Whether this means of propagation, exceedingly rare in Poppies, is common to cultivated plants I do not know, but, though we have grown *M. chelidoniifolia* for twenty years, our plants have not yet produced any such buds. Nor have they yielded a single seed capsule. However, these are not matters of any moment, for increase is easily carried-out by division just when growth begins in spring.

We grow this interesting plant in a fairly moist lime-free soil at the margin of woodland where it gets only part sun. There it fends for itself, with nothing but natural leaf-fall in the way of nutrition, and it does very well. One thing it detests and that is cold wind, the result of which is to shrivel flowers and stem-leaves, transforming an object of delicate grace and loveliness into a brown and melancholy wreck.

A. T. JOHNSON.

THE MAKING OF LANARTH.

By THE RT. REV. J. W. HUNKIN, Bishop of Truro.

(Continued from p. 72.)

GEORGE FORREST visited Lanarth on May 22, and E. H. WILSON came about July 24 to spend a Sunday. While he and Mr. WILLIAMS were in the shrubbery by the *Magnolia officinalis* Mr. WILLIAMS slipped and broke his thigh again. Mr. WILSON went back to the house for help, but though the house was not more than four hundred yards away he lost himself in the garden and was about an hour in finding it. Mr. WILLIAMS was in bed until December and after that got about but slowly. He was still crossing various Rhododendrons, and in November a plant of *Magnolia macrophylla* came from Lord DE ROTHSCHILD.

Next February (1921) he layered his best pink *R. Fortunei*, planted a group of an *Azalea indica* of FORREST's in the Outer Circle, and cleared a hole near the drive for some Leonardslee Rhododendrons. He also had a dozen Azaleas from ANTHONY WATERER, two *campylocarpum* × *Aucklandii* from Penjerrick, a nice plant of *Magnolia macrophylla* from LIONEL ROTHSCHILD, a plant of WILSON's Bamboo from Kew; also a small plant of *Nothofagus Dombeyi*, and *Juglans cathayensis*, a fine-foliaged Walnut, one of WILSON's introductions from China.

About the same time he moved some of his big *Viburnum tomentosum Mariesii*. This spring, the spring of the Coal Strike, there were a number of visitors, including Col. STEPHENSON CLARKE, Mr. RAFFILL of Kew, MARK FENWICK, L. JOHNSTONE, and Lord HEADFORT.

The same year Camellias 'Lady Vansittart' and 'Nagasaki' came from Guernsey, and *Rhododendron Cufeanum*, sent home by Lady WHEELER CUFFE, came from Glasnevin.

June and July until the 25th were very dry—fifty-five days giving only 0.47 inches of rain; September again was dry, and no plants could be moved. "The *obtusum* type did very well with autumn growth, but all the late growing Rhododendrons—*sinogrande*, *lacteum* etc.—made most feeble and disfiguring efforts at growth. A twelve-inch *sinogrande* leaf could not be found this year, whereas in 1920 we measured them over twenty-six inches without stem."

A number of FARRER's Rhododendrons came from Gunnersbury, with *Rhodoleia Championi* (Farrer 825, the first to flower in England about 1936) and *Gordonia axillaris* (which flowered well about 1937), etc. Other Rhododendrons came from Mr. MAGOR at St. Tudy. Mr. J. A. CAMPBELL sent from Scotland a ball plant of true *R. zeylanicum* raised from seed sent home by him from Ceylon.

"Mr. A. Soames, Sheffield Park, sent me a layer of *Embothrium longifolium*, said to be a distinct var. Curiously I have to-day noticed for the first time some fifteen or twenty suckers coming up from the *Embothriums* by the side of the drive. I never saw this here before, but have seen it in mown grass where the roots had been damaged."

Mr. WILLIAMS also procured a number of plants from WHITE's, including a Tupelo for autumn foliage, *Nyssa sylvatica* (from North America), *Fothergilla major*, Snowy Mespilus and *Carpinus yedoensis*,

besides some *Prunus*, *Acer*, and *Rhododendrons*. About seventy seeds of Black Jack Oak (*Quercus marylandica*) came from the Arnold Arboretum, some of which Mr. WILLIAMS sent to Caerhays, Gunnersbury and Kew.

At Chelsea next year (1922) Mr. WILLIAMS gained the A.M. for two *Rhododendrons*: 'St. Keverne,' one of his own crosses, *Kingianum* × *Griffithianum*, a bright red with a few dark-brown spots in the interior of the flower; and 'Robert Fortune' (*Aucklandii* × 'H. M. Arderne') with large and handsome trusses of palest pink, with a crimson marking at the base of the flower. That July *R. eriogynum* flowered at Lanarth for the first time—"it seems to me a quite remarkable plant and flower: colour vivid scarlet, not crimson, trusses broad and full. The leaf too is very good and contrasts well." Mr. J. C. WILLIAMS sent some "*R. Griersonianum* from pan—he thinks a lot of this." There were more crossings of *Rhododendrons*, and of *Azaleas* for late colour (including as females pink *occidentalis* hybrid, latest *occidentalis* hybrids, latest orange). More *Rhododendrons* came from MAGOR's, and from elsewhere more Kurume *Azaleas* (several varieties), *Euonymus latifolius*, some *Hydrangeas*, a couple of *Cotoneasters*, *Styrax japonicum Fargesii*, and *Fagus rotundifolia* (now a fine great tree).

Again, from Mr. J. C. WILLIAMS on November 22, came a number of *Rhododendrons* including *brevistylum* and *chasmanthoides*, *Clethra Delavayi* (which proved quite hardy), and *Quercus cleistocarpa* (which became a fine plant); from MILLAIS, *Magnolia Brozzonii*, and from Chenault a number of things such as *Euonymus yedoensis*, *Cercidiphyllum sinense*, and *Liriodendron pyramidale*, the Tulip tree in form like a Lombardy Poplar.

Next year (1923) Mr. WILLIAMS sent a number of large *Rhododendron* plants to Kew: *RR. Thompsoni*, *Shilsoni*, *Kingianum*, 'St. Keverne,' *Aucklandii*, *triflorum*, *irroratum*, good form of *arboreum*, *Delavayi*. This was in February. It was a very wet spring and a great many shrubs and trees from the nursery were planted up to the end of May. That month Mr. WILLIAMS procured a set of Mangles *Rhododendrons* from SANDER of Ghent (twelve varieties). A collection of twenty-six sorts of Kurume *Azaleas* came from Colonel STEPHENSON CLARKE, and *Juniperus procera* sent by a friend from W. Africa. In September LIONEL DE ROTHSCHILD sent a box of *Rhododendron* seedlings (Forrest's hybrids), and in December *Jasminum polyanthum*, *R. strigillosum*, and a couple of difficult *Prunus* from Edinburgh. This year Mr. WILLIAMS was President of the Royal Cornwall Show which was held at Camborne. Mr. WILLIAMS was still buying *Rhododendrons*, e.g. 'Mrs. Lindsay Smith' and 'Hugh Wormald,' from Boskoop. He quotes Mr. BEAN's opinion that the former is the best white hybrid. He also got six double deep rose *Azaleas* and a few of the best purple *Rhododendrons* from Knapp Hill.

In 1924 Mr. WILLIAMS slipped in his smoke-room and again broke a leg; and there is hardly anything in the Garden Book for that year. For the same reason there are hardly any entries for 1924 and 1925 in another MS. book in which Mr. WILLIAMS gives most interesting accounts of the notable gardens he visited. He had great powers of observation, and he was always ready to learn from other people.

Spring next year (1925) was early. *Prunus Pissardi* ('Paul's Pink') was in full flower on February 8, so was *R. zeylanicum*, "the best *Rhododendron* to-day." "Some hybrid *Pr. Juliae* of ours are quite nice." On November 24 Mr. WILLIAMS sustained a great loss

through the death of his head gardener, Mr. FREDERICK GREET. Mr. WILLIAMS writes :

" FREDERICK GREET died on November 24th 1925 in his sleep. He had apparently been perfectly well when he went to bed. GREET came here as gardener when I came to live in 1893. He was not quite twenty-one at that time and just married. He went to Gunnersbury for a few weeks about 1900 to have experience indoors. He came from Mr. NAYLOR CARNE's garden at St. Agnes, where there was a good collection of plants. He carried out my wishes in planting shrubs, in crossing Narcissi, and in other gardening details for thirty-three years. No man ever had a more devoted or loyal servant, and his loss is irreparable."

The last plants GREET planted were some *Magnolia parviflora* S.E. of the big *Magnolia hypoleuca*.

The first month of 1926 was wet. Mr. WILLIAMS noted " the lemon *Hamamelis japonica* very nice, it is always later than the others." The summer proved very dry ; Rhododendrons made very few flower buds ; rabbits did more damage than usual. Mr. BEAN visited Lanarth in November and noted the following as desirable for Kew : *Vinca acutiflora*, a *Drimys Winteri* (with a very white under leaf), an Escalonia hybrid from *langleyensis*, *Viburnum tomentosum* (Lanarth form—very large and impressive), *Rhododendron fastigiatum* \times *diaprepes*, *R. auriculatum* \times *diaprepes*, a mauve Rhododendron (this must have been Mr. WILLIAMS' own cross *niveum* \times *Ririei*), *Olea excelsa*, a late Waterer Azalea.

Things started late the following year (1927), but the season picked up very rapidly in March. The shortness of bloom on the Rhododendrons was quite extraordinary, and there were scores of large plants without a bud. May was very dry, August and September very wet. " We put out the usual number of new things, *Magnolia nitida* and *rostrata*, *Pieris Forrestii*, etc. Rhododendrons came from Exbury and Holland and elsewhere, and several from Caerhays including, about Christmas, a splendid plant of Cornish *Loderi* and Mr. J. C. WILLIAMS' *Maddeni* cross—they came by lorry and came well." It was this year that Mr. WILLIAMS was awarded the V.M.H.

Next year, 1928, Mr. WILLIAMS counted fifty consecutive wet days to February 18, followed by east wind. There was severe frost in the middle of March. Few plants were damaged, but Rhododendron buds on many plants were wholly or partly destroyed. *R. barbatum* and its allies were most resistant. This wet year things grew a great deal and Mr. WILLIAMS notes that he is very short of room, and has had to cut out a lot of plants, e.g. two large *Pinus insignis* in front of the house and a fine *Ilex diphyrena*. Two Rhododendrons planted that year are mentioned in a later note as well established : ' Duke of Athlone,' and ' Eileen.' In September Mr. WILLIAMS received the A.M. for that tender New South Wales evergreen, *Bursaria spinosa*.

Spring was very late in 1929. There was a good deal of frost but nothing like as serious as in the Midlands. At the beginning of April the Rhododendrons were " very bad indeed, blind and pinched from frost," but the Magnolias were good. March and April were very dry. On May 10, a note reads :

" We put out Camellias 20490 and 27165. There are not many of these . . . Embotriums opening and good ; Aucklandii opening but shy ; Azaleas promise well."

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EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

ANNUAL GENERAL MEETING.

FEBRUARY 20, 1945.

REPORT OF PROCEEDINGS at the ONE HUNDRED AND FORTY-FIRST ANNUAL GENERAL MEETING, held on Tuesday, February 20, 1945, in the Lecture Room, New Hall, Greycoat Street, London, S.W. 1.

The Lord ABERCONWAY, C.B.E., V.M.H., President, in the Chair, with Members of Council and over two hundred and forty Fellows.

The PRESIDENT: Ladies and Gentlemen, it is now three o'clock and therefore we will start the proceedings of the 141st Annual Meeting of the Society. I should just like to announce to you an apology for non-attendance from our old friend, Mr. CHARLES MUSGRAVE who, while he is not well enough to come here, is better than he has been, and sends us all his very best wishes.

I will now call upon the Secretary to read the Notice convening the Meeting.

The SECRETARY read the Notice convening the Meeting and announced that the Minutes of the previous Meeting had been circulated in JOURNAL No. 69, Part 4 (April 1944).

The PRESIDENT: I beg to move

THAT the Minutes be taken as read, and also

THAT the Minutes be adopted.

(The Motion was carried and the Minutes signed by the Chairman.)

The PRESIDENT: I rise now to move the adoption of the Report of the Council for the year 1944.

We face to-day a very different outlook from that which we have faced in the past few years. I have vivid recollections of the years 1939, 1940, 1941, 1942 and 1943, and how depressing was the prospect when we had our Annual Meeting! In 1944 I had not the privilege of being present. A childish ailment, warranted not to attack people over 44 years of age, struck me down. That was rather a compliment—twenty years taken off one's age by a microbe! It was my loss, but at the same time it was your gain, because our good friend, Mr. BOWLES was kind enough to take the Chair. This time I am happy to be with you again when we look on the end of the war, and we must congratulate ourselves that we have kept the ship of the Society afloat, and not only that, but that we have kept it afloat with a fine reserve of buoyancy. That is due to the fact that the ship was stoutly and correctly fashioned; and that our Fellows, who had been docked of their privileges, deprived of Chelsea, and even of the majority of the Fortnightly Shows, continued nobly to support it. Not only did they preserve the ship from sinking, but their support enabled the Society to carry out a very notable programme of war-work. I would just remind you of it very briefly: for food production there was the great number of lectures that we held, the photographic slides we exhibited, the demonstrations, the publications—noteworthy among the latter was the preparation and sale of *The Vegetable Garden Displayed*, which ran to no less than 300,000 copies. If all the people who bought

those copies obeyed the directions given in that and our other literature as to the cultivation of their gardens, it must have made a very substantial addition to the amount of produce that came out of them.

Then we carried out some special scientific research at Wisley at the request of the Government on certain plants, notably on Flax and Rubber plants, and we tested out for the Government a vast number of Lease-lend seeds which we had as a country received.

Apart from that, our Red Cross sales contributed to the funds of that admirable institution, and we were able to some small extent to alleviate the tedium of some of our prisoners-of-war abroad by setting them examinations. When I was a boy I did not think examinations relieved any tedium, but apparently anything is better than doing nothing in a prisoner-of-war camp. Also, thanks to the kind assistance of various seed firms, we were able to send parcels of seeds to a number of prisoner-of-war camps. As well as that our two halls were used throughout the war for a number of war purposes. That, I think, is a record of which we have good reason to be proud, and we have been able to achieve it because of the continued and loyal support of our Fellows.

Now what of the future of the Society? Personally, I think it is very bright. This year our Fellowship has increased by over a thousand. We are still 10,000 behind our pre-war record of Fellows, but I believe that that number will be rapidly regained. Why? Because I think that the gardening spirit of this country should be and is stronger than ever. We have been glutted with vegetables during the war, but we have been starved of flowers, and now that the war is about to end, I think that the reaction will come.

I remember when the great scheme at Delhi in India was in its early stages, Sir EDWARD LUTYENS asked my wife and myself to come and look at the sketch plans of the great new city. He showed us the plan of the great hall, the Durbar Hall with its marble and bronze pillars, and he said, "In that great Hall the Viceroy will receive the homage of all the Princes of the Empire." And then he showed us a little enclosure, a small courtyard with very little ornament, quite small, and said "after the representative of the King-Emperor has discharged his duties of State, he will retire to that little courtyard and turn back somersaults in his pyjamas." That was an illustration of reaction. I do not propose to insinuate for a moment that any of the Fellows of this Society whom I see seated round me to-day will react in that form. They would not do anything so undignified even in the seclusion of their back gardens, but I do think that the reaction will be there. They will say "Banish the vegetables from the flower garden to their proper places in the kitchen garden." I am very fond of vegetables, but I do not want to share my flower garden with vegetables, in the same way that while I am very fond of bacon, I do not wish to share my house with the pig. We all have dreams of our gardens revived. Those dreams I hope are maturing into plans, and before many months are passed I hope those plans may mature further and become achievements. But we must be cautious. If our dreams have included acres of Roses and great glades of Lilies, when we look at the catalogues and see that the best our friends the nurserymen can do is to give us Roses at 5s. a plant and Lilies at 10s. a bulb, and when we recollect that the tax-collector is knocking at the door, I think some of those dreams will still remain dreams. But, at the same time, we may realise more modest dreams. That plant of Phlox which we preserved during the war, because it grew in so poor a place that we could not plant a Cauliflower there, will be divided up. The Michaelmas

XX PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Daisies underneath the bushes will be pulled apart, and with other additions, we shall get our beloved herbaceous border going again. We have almost forgotten the name of herbaceous border. Asked what a herbaceous border was, a small boy thought a little and then said, "I think it must be a lodger who does not eat meat."

But there would not only be the former gardeners with their gardens gradually being restored to their pre-war beauty, I look forward also to there being a vast number of new gardeners, who have learnt gardening by growing vegetables and are now going to aspire to higher things. They will join our ranks, and swell the membership of our Society.

Now what of the Society itself? Wisley has lost little during the war. It is not as tidy as our good friend, Mr. HARROW, would wish, but it is still beautiful and still very interesting, and the notable plants and shrubs have not stopped growing because the war has been on. Next year I hope we shall have the trials of flowering plants at their best again, and very soon we shall have those two great additions to Wisley, the Green Line bus and the basic petrol ration, so that we can get there in more comfort.

In regard to our publications, Col. STERN's *Study of Paeonies*, a very sumptuous publication, is ready to be issued at any time, and our great work, the Royal Horticultural Society's *Gardener's Dictionary*, is almost complete and ready for the Press. That dictionary, as I think you know, is founded on the scheme of that valuable publication, *Nicholson's Dictionary of Gardening*, a publication which is now out of date, but we are taking the same principles which have stood the test of time and founding an up-to-date dictionary upon them. We have entrusted the editorial work to Mr. CHITTENDEN; than whom there is no one who knows more about plants of every kind. And when I add that the Clarendon Press is co-operating with us, both in the work of garnering the material and publishing the volumes, I think you will agree with me that the work will be worthy of the Royal Horticultural Society.

Then there is the question of our Shows. We cannot unfortunately this year hold a Show at Chelsea. There are no tents. The tents we had before the war have gone the way of many good things and we cannot get new ones. Nor would there be that great volume of plants in the hands of the nurserymen which would fill those great alleyways that we so well remember. Chelsea, I fear, must wait for 1946, but we have every hope of holding the first post-war show there in that year. Our Halls are intact but for glass, and we have even achieved the reglazing, as you will have seen, of the old Hall. We will this year, I hope, have a Spring Show lasting three days in both Halls at about the same date as we used to hold Chelsea.

We propose during the year rather to increase the number of competitions that we have had in the past. They always attracted most excellent exhibits, and we are going to revive a competition for flower arrangements where the amateurs on the one hand and the professionals on the other will arrange vases of flowers in little hutches. We had a competition of that kind which was very well patronised in the Autumn before the War, and they have always been a great attraction at all American Shows. You will have to remember this year that plants are scarce and carriage is difficult, and you will not see such a gorgeous display of exhibits as we were wont to have in years gone by. On the other hand, nurserymen have naturally preserved their best plants, and if their groups lack size, they will not necessarily lack interest.



FIG 35 ---ARUNDINARIA ANCEPS AND POPULUS LASIOCARPA AT LANARITH
(See p. 107)



FIG. 36.—*MAGNOLIA DAWSONIANA* AT LANARTH.
(See p. 110.)



FIG. 37 —ORIGINAL TREE OF APPLE 'BRAMLEY'S SEEDLING,' JUNE 1922.
(See p. 102.)



Photo, Collingwood Ingram

FIG. 38. *LEUCOSPERMUM MINTUM*
(See p. 110.)



FIG. 39.—*LEUCOSPERMUM MINIMUM* GROWING NEAR STANFORD, C P. AN ORNITHOPHILOUS SPECIES
(See p. 110.)

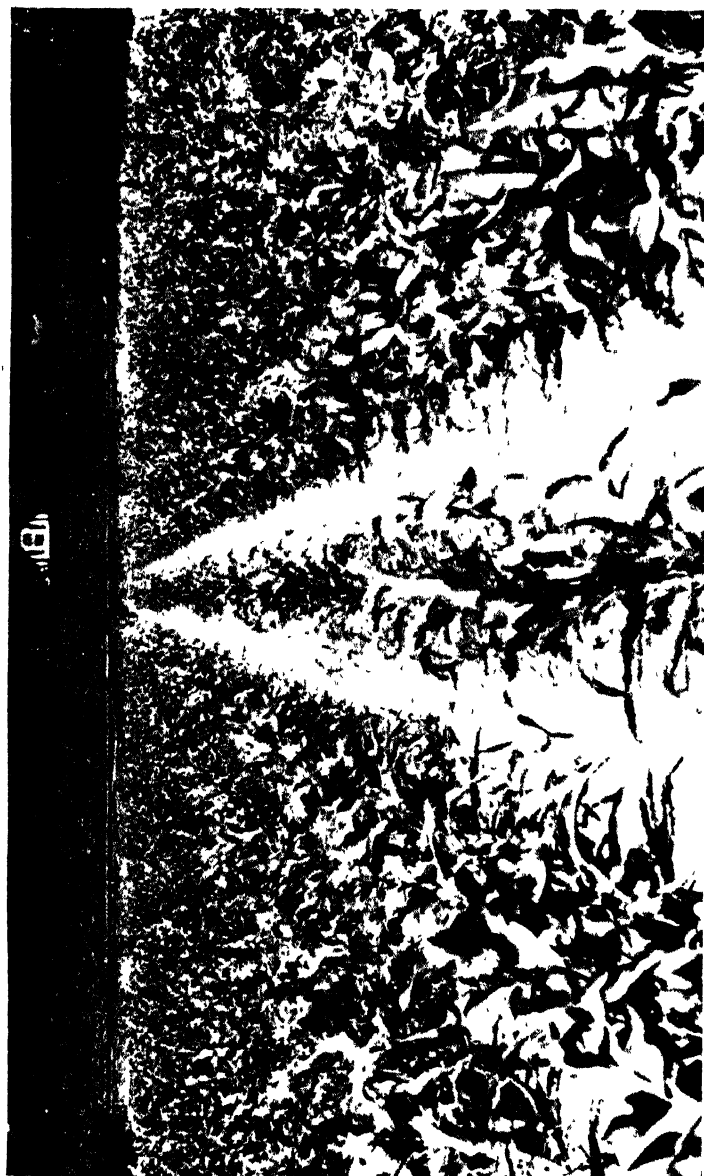


FIG. 40.—THE FIRST CROSSING PLOT OF SWEET CORN IN ENGLAND 'CANADA GOLD' - C 13 MERTON, 1940
(See p. 117.)

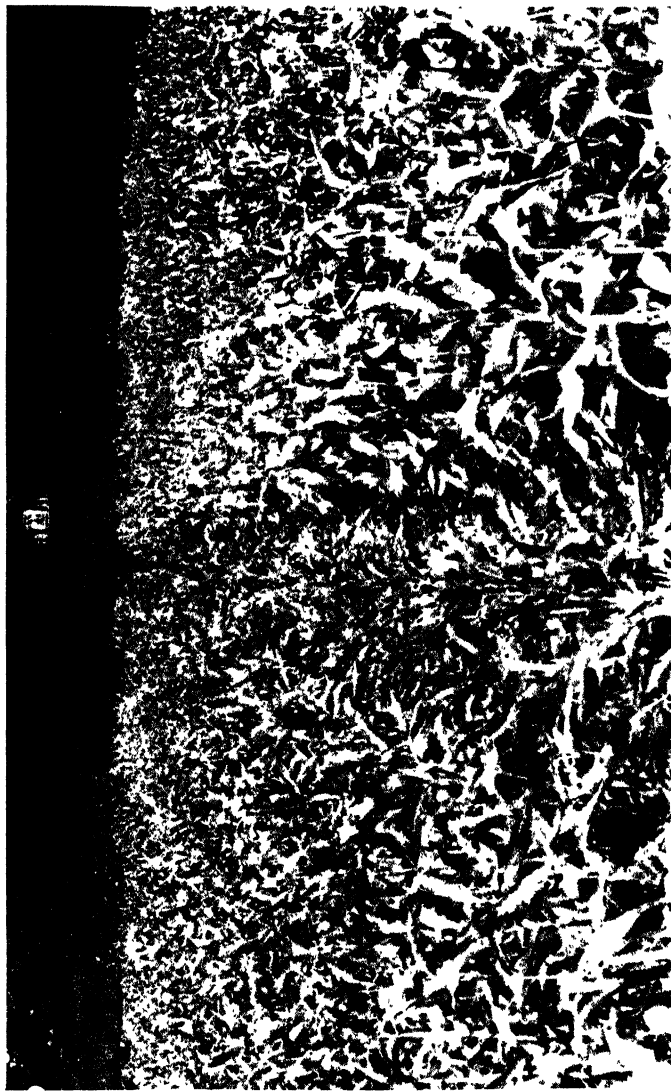


FIG. 41 —THE SAME PLOT LATER IN THE SEASON SHOWING DOUBLE ROWS OF FEMALE PLANTS WITH TASSELS REMOVED, INTER-PLANTED WITH SINGLE ROWS OF MALE PLANTS WHOSE TASSELS HAVE BEEN LEFT.

(See p 117)

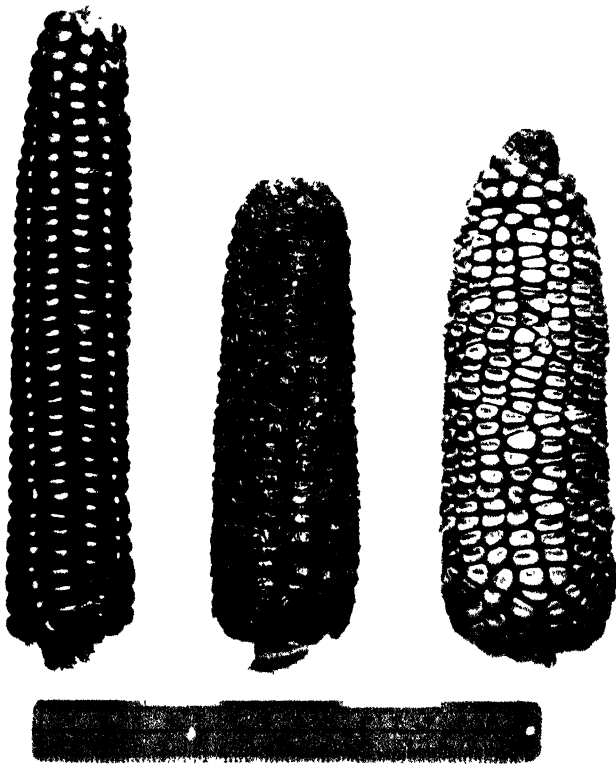


FIG. 42 - FLINT CORN, SWEET CORN, DENT CORN
(See p. 111.)

There is one other thing about our Shows. You do not come only to the Shows to see the exhibits, you come to the Shows to see your friends, and I have been greatly struck with the large attendance of Fellows at the Shows we have been able to hold in the past war years. I look forward to the Society's Shows gradually—I would almost say rapidly—regaining the ground that has been lost.

We have the usual changes in the membership of our Council. We regret to lose this year Mr. CHEAL with his great knowledge of the business side of horticulture, Mr. STEVENSON, an expert on Rhododendrons and many other things, and Dr. TAYLOR, who has been good enough to keep us closely in touch with the Ministry of Agriculture. The help of all these three has been invaluable and we shall look forward to their return to our counsels before many months are past. In place of them we have two old friends, Mr. BOWES-LYON, who has been doing important work for the Government during the war, Mr. SECRETT, who has been planning with the Ministry of Agriculture the growing of produce in war time and also for after the war, and I know no one whose advice on such matters could better be taken than Mr. SECRETT's. We have one new member; the DUKE OF DEVONSHIRE has been good enough to accept our invitation to serve on the Council, and it will shortly be announced that you have duly elected him. It was about 86 years ago, when the Society was much younger, that the DUKE OF DEVONSHIRE of the day was your President, and the present holder of the title has the family love of plants and its talent for administration.

I have expressed our gratitude to our Fellows, but I must also express our gratitude on your behalf to our Staff. We have a wonderful Staff, and if I were asked to say one thing about them more than another it would be this: the Society always come first and we have the most loyal and efficient service that can be imagined.

Then again, few bodies have the advantage of more voluntary help than has this Society. There are the members of the Council, members of Committees, the examiners, and last but not least exhibitors, busy men, distinguished men, but always prepared to give long hours in the service of the Society. We are very grateful to them.

I now move the resolution

THAT the Report of the Council for the year 1944 be and is hereby adopted

and I have pleasure in asking Mr. TROTTER, our Treasurer, to second it.

Mr. R. D. TROTTER: Mr. President, Ladies and Gentlemen, if you will allow me to refer to the Accounts that have already been published in our JOURNAL, I would like to try and give you a few explanations of the figures. This time, as you see, we have given you the previous year's figures on the left-hand side of the page to compare with the current figures. London Establishment Expenses, though a big total, come out at almost exactly the same. May I leave the net increase in expenditure on Wisley of £4,642 to be explained later?

The JOURNAL and other publications: owing to the increase in the Fellowship of 1,029 during the year, we had to print 25,000 more copies of our JOURNAL. Our sales and advertisement revenue was reduced to £1,400 as we were only able to issue 46,000 copies of *The Vegetable Garden Displayed* as against 74,000 in 1943, owing to paper shortage, but the printing of them of course cost us £1,000 less. These two items account for the increased expenditure of £1,148 under this heading of JOURNAL and other publications. We have maintained

the usual appropriation of £3,366 to the old and new Halls Sinking Fund.

On the other side of the sheet, Fellows Subscriptions increased our receipts by £1,434 to £34,800 compared with £53,500 at December 1938. We hope, with the assistance of your good selves and all other garden lovers, to get back to that figure and increase it—as the President has already asked you to try to do—so as gradually to reinstate the past privileges of pre-war days for our Fellows. There has been a decrease in Hall lettings since the stand-down of the Home Guard and the impracticability of letting the Halls more often, for reasons which you all know. The two Halls are, however, now in a state of repair which allows for letting, and we hope we may be able to increase our revenue from that source in future. The year's result is an over-expenditure of £5,021, which we have deducted from General Reserve this time against a surplus of £507 in 1943, added to General Reserve. I would remind you that in 1942 we had to deduct £4,300 as against £5,021 this year. You will see this more clearly set out perhaps in our Balance Sheet on the next page of the JOURNAL, where our General Reserve now stands at £34,756 or £5,000 less than it was in December 1938. The Bank overdraft is increased by £2,637 and Sundry Debtors have decreased by £1,150. The usual additions have been made to the Funds, and the investments representing those funds are correspondingly increased. Their market value is once again in excess of their book value.

Now I come to Wisley and the figures in the JOURNAL. Most of us have very good cause to remember the bad frosts of last May, and Wisley Garden was as hard hit as most. The frosts came at a critical time for the fruit tree blossom, and when I went round the Fruit Trial Ground with the Director and Mr. POTTER early in July, it really was quite easy to count the individual fruit on all those large trees. It was almost non-existent. You will see the effect in the Wisley figures in that the garden sales fell by just over £4,000, but we must remember that the 1943 receipts were exceptionally high. At the same time, salaries and wages in all departments increased by £1,000, mostly due to the higher agricultural wages. In spite of a number of economies, these two items I have mentioned account for the increase in expenditure on the Wisley Garden of £4,642, on the year, and also for most of the over-expenditure to which I have already referred. We are accustomed to hear of assets being frozen these days and I fear one of our best assets, the fruit crop at Wisley, has joined the prevailing fashion rather too literally. The various Trust Fund Accounts are clearly set out and call for no comment.

Our Auditor, Mr. GORDON FEATHER, is sitting on my left, and between us we will endeavour to answer any questions you may like to ask.

Mr. President, I have much pleasure in seconding the adoption of the Report.

The PRESIDENT: The resolution has been moved and seconded, namely

THAT the Report of the Council for the year 1944 be and is hereby adopted.

Does any Fellow desire to ask any questions?

(No questions having been asked, the motion was put and carried unanimously.)

Mr. E. A. BOWLES : Lord ABERCONWAY, Ladies and Gentlemen, I rise to perform the task that falls to my lot on this occasion, and before I do formally refer to that, I should like to congratulate myself and all the Fellows of the Society and Lord ABERCONWAY that we find him in the Chair again after his youthful ailment, evidently strengthened in his youthful vigour, and we hope it may long continue.

All I have to do to-day is to announce to you that in response to the unanimous request of the members of the Council, Lord ABERCONWAY very kindly consented to let his name go forward again for re-election as our President, and as there has been no other name put forward, as you might well imagine would happen, it is my great pleasure to announce that under By-law 59, Lord ABERCONWAY is rightly and duly elected as our President for the year 1945.

The PRESIDENT : Mr. BOWLES, Ladies and Gentlemen, I thank you, as representing the great body of Fellows, for re-electing me your President. I can assure you that there is no honour which I value more than the honour you do me in electing me President of this great Society. In filling this position I am doing a thing in which I take the greatest personal interest and pleasure.

I have now to declare the election of the following Vice-Presidents :

His Highness the Maharaja of Nepal.	Mr. F. Cleveland Morgan.
His Highness the Maharaja of Jammu and Kashmir.	Sir Frederick Moore.
Field-Marshal The Rt. Hon. Jan C. Smuts.	Mr. B. Y. Morrison.
The Viscount Ullswater.	Mr. C. T. Musgrave.
Professor L. H. Bailey.	Mr. C. G. A. Nix.
Mr. E. A. Bowles.	Colonel the Hon. Sir Heaton Rhodes.
Mr. Alister Clark.	Sir William Wright Smith.

Then I declare the election as members of the Council of
 The Duke of Devonshire.
 The Hon. David Bowes-Lyon.
 Mr. F. A. Secrett.

Then I declare the election of Mr. R. D. Trotter as Treasurer.

Then I declare the election of Mr. F. G. Feather, of Messrs. Harper, Feather and Paterson, as Auditor.

Now we come to the various presentations.

The SECRETARY : **The Victoria Medal of Honour**—to British Horticulturists resident in the United Kingdom and deserving special honour at the hands of the Society.

Mr. W. D. BESANT—for his services to horticulture, especially as Director of the Glasgow Parks and Botanic Gardens.

The PRESIDENT : Mr. BESANT is one of three brothers, very distinguished indeed in horticulture ; one was well known to us as Mr. BESANT of Glasnevin, he was also honoured by the Society, and we have to mourn his recent untimely death. But we rejoice to-day in honouring his brother, Mr. W. D. BESANT of Glasgow.

The SECRETARY : Mr. M. B. CRANE—for his work on fruit cultivation and on the genetics and origin of garden plants.

The PRESIDENT : Mr. CRANE has done the most splendid work,

especially on the genetics of fruit at the John Innes Horticultural Institution. We all of us remember not so many years ago when genetics was a closed book to everyone, but thanks to the work of research by Mr. CRANE and his colleagues, this science has developed, and I think that in the future we shall be very much indebted to those who have contributed to a work of such great importance to our plant and fruit growing.

The SECRETARY : Dr. J. HUTCHINSON—for his work on systematic botany and for horticulture generally.

The PRESIDENT : Dr. HUTCHINSON is, as you know, one of the leading systematic botanists of the world. Among the sections of plants in which he has interested himself has been that very difficult and complex class of plants, the lepidote section of Rhododendrons. Dr. HUTCHINSON will take a group of Rhododendrons of the same species, and with a stroke of the pen and a word he has made them into two different species.

The SECRETARY : Mr. W. E. TH. INGWERSEN—for his wide knowledge of plants and his work in collecting new and rare species.

The PRESIDENT : Mr. INGWERSEN has long been known to us all and has helped us all. If a man is distinguished for making let us say steel plates, he need have no love of steel plates, he can make them quite well without. But if a man deals in plants he is never a successful nurseryman unless he loves the plants in which he deals, and Mr. INGWERSEN is a noteworthy example of that. Every plant he grows in his nursery is a personal friend ; many of them he has collected himself in their lairs in the mountain fastnesses of far countries, and we are delighted to give him the Victoria Medal of Honour.

As **Associates of Honour** the following have been elected :

Mr. H. H. COOK, Superintendent of the Reading University Horticultural Station at Shinfield.

Mr. J. HOPE, Head Gardener at Ness, Neston, Wirral, Cheshire.

The **Veitch Memorial Medal in Gold**.—To Colonel STEPHENSON R. CLARKE.

The **Veitch Memorial Medal in Gold**.—To Mr. WILLIAM H. JUDD.

The **Veitch Memorial Medal in Gold**.—To Dr. J. RAMSBOTTOM.

Dr. ROGER SMITH : I have the pleasure of rising to propose a vote of thanks to our President for presiding at this meeting this afternoon. I am quite sure that all of us look forward to this Annual General Meeting with great anticipation and pleasure, and this year we have not been disappointed, and I have very much pleasure in proposing a very hearty vote of thanks to our President.

Mr. WALLACE : My Lord President, Members of the Council, I rise with equal pleasure to second that vote of thanks. I have been to many meetings, in fact I feel almost ashamed to say how long ago it is since I first attended the R.H.S. meeting in 1884, but I have never at all the meetings I have attended seen more enthusiasm, and more brilliant occupation of the Chair than we have had during these last years. I have the utmost pleasure in seconding the vote of thanks.

The PRESIDENT : Dr. ROGER SMITH, Mr. WALLACE, Ladies and Gentlemen, I must thank you for the kind words which you have used in moving and seconding the vote of thanks, and I must thank the Fellows for the cordiality with which they have received it.

(The proceedings then terminated.)

The summer was again very dry and from November to December there were a number of violent gales. The worst of these Mr. WILLIAMS describes as follows :

"On December 4th and 6th we had the worst storms I have experienced. At Scilly 108 m.p.h. and at Falmouth 105 m.p.h. were recorded mostly W. and S.W. The second was the more severe. About fifty shelter trees were blown down around and in the garden, and in the ten acre and other woods far more. A very large Elm in front of the house about 100 feet high was uprooted, several very large *Pinus insignis*, but the *C. macrocarpa* suffered most severely of all. Under the violent wind the branches matted upwards and so offered a definite flat face to the gale and down they came flat crushing everything below them quite flat. Oaks were twisted but were not so brittle, *P. insignis* and Elms uprooted. Beech stood best, *Thuja gigantea* seemed to stand well, the wind getting through their growth. *Griselinia* seems more firmly rooted than Laurel."

1930 was a good year for growth but not for flower. The rainfall was about fifty-two inches, "quite high for us." Spring was extremely late and there was a good deal of east wind. "We bought very few plants," Mr. WILLIAMS writes, "being very short of room. . . . I bought two small *Fothergilla monticola*, it is a very nice shrub with us and colours well. I scrapped the large Parrotia."

Next year again spring was very late and Rhododendrons were not at their best till the middle of May. There had been a lot of rain and cold east wind. *Rhododendron sinogrande* was "quite good this year." In September Mr. WILLIAMS writes :

"We have had an extremely wet summer and little sun. Several plants died from wet, but growth has been good, though flowers were fugitive and not good. Embotriums, Leptospermums, conspicuously bad. We had a very severe easterly storm early in August and leaves badly browned. It got into many places and did great damage. Thorns and hedgerow stuff lost every leaf. Several trees down. I am shortening garden labour considerably."

There follows in the Garden Notes a very valuable list : "A list of my most interesting specimen plants, September, 1931." The plants are named with figures indicating dimensions. Rhododendrons and Azaleas are not included. It will be noted how unusually large many of the plants are. The alluvial soil of Lanarth promoted exceptional growth.

In front of house and drive :

<i>Magnolia Watsoni</i>	14 feet	
„ <i>sinensis</i>	14	„
„ <i>Sargentiana</i>	22	„
<i>Camellia reticulata</i> group	35 feet × 12	„
„ 'Lady Clare'	10 „ × 15	„
„ Single White group	24 „ × 12	„
Fastigate Cherry 'Apple Blossom'	28	„
<i>Schizophragma integrifolia</i>	18	„
<i>Leptospermum Nicholssii</i>	18	„
<i>Olearia ilicifolia</i>	12	„
<i>Trochodendron aralioides</i>	15 feet × 15	„
<i>Cupressus Lawsoniana</i> var. <i>intertexta</i>	32	„ (A good plant now)
<i>Clematis indivisa</i>	45	„
<i>Photinia Nicholsoniana</i>	30	„

<i>Populus lasiocarpa</i>	40 feet	(damaged 1933, died later)
<i>Olea excelsa</i>	28 "	
<i>Fothergilla major</i>	10 "	
<i>Metrosideros lucida</i>	12 "	
" <i>tomentosa</i>	30 "	
<i>Pittosporum eugeniodes variegatum</i>	30 "	
" <i>floribundum</i>	15 "	
<i>Myrtus bullata</i>	12 "	
" <i>cordata</i>	14 "	
<i>Yucca treculeana</i>	8 "	
<i>Rhodostachys Pitcairniifolia</i>	24 feet × 15 "	
<i>Greigia sphacellata</i>	22 "	
<i>Actinidia chinensis</i>		
<i>Rubus cissoides</i>		
<i>Fuchsia excorticata</i>	15 feet	
<i>Lomatia ferruginea</i>	22 "	
" <i>silaeifolia</i>	3 feet × 6 "	
<i>Camellia theifera</i>		
<i>Abies Forrestii</i>		(died 1933)
<i>Cotoneaster salicifolia</i>	30 "	
<i>Pyrus Niedzwetzkyana</i>	28 "	
<i>Dimorphanthus Forrestii</i>	25 "	
<i>Syringa reflexa</i>	11 feet × 12 "	
Copper-leaved Rhododendron	8 "	
<i>Rhododendron</i> ' Sir Ch. Lemon '	6 "	
<i>Embothrium longifolium</i>	20 "	(died 1933)
<i>Hamamelis mollis</i>	16 feet × 12 "	
<i>Itea yunnanensis</i>	12 "	
<i>Ilex corallina</i>	12 "	(badly cut by frost 1939)

Fine plants near Inner Circle, i.e. from Greygate to Oak door :

<i>Cercis chinensis</i>	20 feet	
<i>Acacia melanoxylon</i>	30 "	
Coral Acer	14 "	
Group of <i>Myrtles apiculata</i>	25 "	
<i>Viburnum tomentosum</i>	11 feet × 18 "	
Green-barked Cornus	20 "	
<i>Aesculus indica</i>	40 "	
<i>Carrierea calycina</i>	30 "	
<i>Ilex insignis</i>	28 "	
<i>Weinmannia trichosperma</i>	20 "	(a fine tree to-day)
<i>Laurus nobilis madeirensis</i>	20 "	
<i>Nothofagus fusca</i>	35 "	
" <i>antarctica</i>	35 "	
" <i>cliffortioides</i>	24 "	
" <i>Moorei</i>	14 "	
" <i>procera</i>	25 "	
<i>Pyrus theifera</i>	24 "	
<i>Lomatia obliqua</i>	11 "	
<i>Panax arboreum</i>	18 "	
<i>Magnolia Thompsoniana</i>	21 "	(regarded by some as a variety of <i>glauca</i>)

<i>Cotoneaster nitida</i>	17 feet
<i>Arundo</i>	18 "
<i>Hoheria populnea</i> var. <i>lanceolata</i>	30 "
" <i>populnea</i>	30 "
<i>Plagianthus betulinus</i>	28 "
<i>Hydrangea aspera</i>	11 feet × 15 "
<i>Camellia cuspidata</i>	14 "
<i>Prunus Padus cornuta</i>	32 " (commutata ?)
<i>Cupressus cashmeriana</i>	21 " (a fine plant now)
<i>Drimys Winteri</i>	40 "
<i>Phyllostachys Quiloi</i> var. <i>Marliacea</i>	18 "
" <i>Mitis</i> var. <i>heterocycla</i>	18 "
<i>Eucryphia cordifolia</i>	24 "
<i>Prunus Sargentii</i>	18 "
<i>Pittosporum (nigrescens)</i>	45 "
<i>Magnolia Dawsoniana</i>	14 "
" <i>Delavayi</i>	24 "
" <i>hypoleuca</i>	35 "
<i>Pyrus caloneura</i>	15 "
<i>Arundinaria fastuosa</i>	25 "
<i>Cornus</i>	
<i>Grevillea longifolia</i>	10 "
<i>Berberis Knightii</i>	10 "

Inside the wood :

<i>Cupressus Wisseli</i>	30 feet
<i>Hoheria (Plagianthus) Lyallii</i>	24 "
<i>Eucryphia Moorei</i>	14 "
" <i>Billardieri</i>	10 "
" <i>Milligani</i>	12 "
<i>Athrotaxis selaginoides</i>	18 " (died 1933)
Chinese <i>Sorbus</i> ?	30 " (died 1933)
<i>Acer nikoense</i>	26 "
<i>Fagus rotundifolia</i>	14 "
<i>Nothofagus Dombeyi</i>	30 "
" <i>Menziesii</i>	25 "
<i>Tetracentron sinensis</i>	16 "
<i>Gordonia anomala</i>	18 "
<i>Deutzia Wilsoni</i>	15 "
<i>Stuartia sinensis</i>	28 "
<i>Rhus verniciflua</i>	40 "
<i>Rhodoleia Championi</i>	11 "

Space allows of only a few remarks on this list. When *Leptospermum Nicholsii*, now a very tall plant, is flowering, it has a white *Olearia* in front of it, and the combination is very pleasing. *Metrosideros lucida* was covered with flower in 1943. The copper-leaved *Rhododendron* is a curious plant, known in the garden as *R. Daubuzi*. It resembles *Aucklandii*, but while the young leaf is green the adult leaf becomes a strange and striking brown. The *Hamamelis mollis* is now larger still. It is draped in lichen but seems to suffer no harm therefrom. In winter the little bright flowers against the lichen are a most arresting sight. *Acacia melanoxylon* is still a fine tree, golden-yellow with blossom, in mid-April. *Benthamias* and *Myrtles* produce seed about the same time. Blackbirds are fond of both and drop the seed so that *Myrtle* seedlings are constantly appearing under the

Benthamias. The best group of Myrtles were brought back from the Pyrenees by Mr. WILLIAMS as tiny plants in a match-box. The famous plant of *Carrierea calycina* (the first to flower in England in 1938) is now covered with lichen. It flowered well in 1940. The *Nothofagus* in the garden are still bigger to-day. They include: *antarctica*, *cliffortioides*, *Cunninghami*, *Dombeyi*, *fusca*, *Menziesii*, *Moorei*, and *obliqua*. The group of *Phyllostachys mitis* var. *heterocycla* became the largest specimen in England. *Eucryphia cordifolia*, *Moorei*, *pinnatifolia*, and *Billardieri* var. *Milligani* are all in the garden; *Billardieri* itself has been lost. *Magnolia Dawsoniana* flowered a pale pink in the spring of 1936, the first to flower in England. It flowered profusely in 1939 and was then awarded the A.M. *Magnolia Delavayi* is now enormous. The great *Magnolia hypoleuca* blew down in 1943.

(To be continued.)

LEUCOSPERMUM MIXTUM.

OWING to the long periods of drought experienced in Cape Province, the vegetation shows marked xerophily, the shrubs and trees tending to have thickened leaves, sometimes protected by a coating of hairs. Characteristic plants are the *Proteas*, whose flower-heads are rendered conspicuous by the cup of highly coloured bracts that surrounds them, and the *Leucodendrons*, the Silver Trees, whose pale foliage is conspicuous in certain districts. Belonging also to the family *Proteaceae* is the genus *Leucospermum*, comprising some thirty-three species; the leaves are entire, sometimes toothed and usually covered with minute curled hairs. The flower-heads are also surrounded by coloured bracts, but even more conspicuous are the styles which project far beyond the perianths after these have opened; generally they are incurving towards the tip and brightly coloured. The interesting point about these plants is that they are ornithophilous—pollinated by birds. Large numbers of small birds, such as the Malachite Sun-birds, can be seen feeding on the nectar. Fig. 38 shows *Leucospermum mixtum*; the foliage is glaucous green and the flowers apricot. In Fig. 39 the habit of the shrub can be seen; these plants are growing near Stanford, Cape Province.

SWEET CORN IN ENGLAND.

By C. D. R. DAWSON, Ph.D.

ONE of the changes in horticulture since the war is the increase in popularity of Sweet Corn. A few years ago it was unknown to the majority of gardeners or at best a mere curiosity, but to-day in the warmer parts of the country rows of Sweet Corn can often be seen standing proudly among the more familiar vegetables of war-time gardens and allotments. In fact the ordinary man is finding that given a good variety adapted to the English climate, he can produce this table vegetable at least as easily as he can Potatoes. Market gardeners, too, have found a ready sale and good price for Sweet Corn supplied to shops, restaurants, hotels and overseas troops. Like the Tomato and Potato, Sweet Corn comes from the New World, and our friends from the United States and Canada have done much to increase the demand for Sweet Corn in Britain. It is not so long ago that Tomatoes were only known and appreciated by the connoisseur, but to-day we cannot produce enough of them. Perhaps Sweet Corn will follow the same course and become one of our most popular summer vegetables as it is to-day in the United States.

The growing interest in Sweet Corn was already felt before the war, and in 1936 the late Sir DANIEL HALL, Director of the John Innes Horticultural Institution, asked me to investigate the breeding of varieties suitable for the climate of southern England. At that time it was essential to get the produce into Covent Garden by the end of July or early August, after which time the demand fell flat owing to the onset of the holiday season. Hence it was necessary to aim at the production of a very early variety with good quality and as good a yield as was possible in the short growing season available. Sweet Corn varieties are known to be often closely adapted to their environment, so that it was unlikely that varieties which grew well in the warmer conditions of the United States would give a good performance in our cooler and wetter summer. The investigations were interrupted by the war, but by the autumn of 1940 it was possible to produce seed of a new hybrid variety, 'Canada Cross' (also known as John Innes Hybrid), which, though by no means final, has now been adequately tested and has given good results during the seasons 1941-44.

There is much confusion in this country as to what Sweet Corn really is. It is, of course, a grass, and is one of the five types of Maize, or as the Americans call it Corn, which evolved among the ancient civilizations of the New World. The five types are distinguished by the nature of their grain. They are called Flint Corn, where the grain is hard and smooth and the food reserve is starchy; Dent Corn, where the grain is hard and starchy, but during ripening the apex shrinks more than the surrounding part, giving a characteristic depression; Sweet Corn, where the food reserve contains a much higher proportion of sugars than in the preceding cases and in consequence, as in Peas, the grain takes on a wrinkled appearance on ripening and also usually becomes semi-translucent (Fig. 42). The remaining two types are of relatively minor importance, namely Flour Corn, where the food reserve is soft and floury, and Pop Corn, where the food reserve is very hard but explodes on heating, so that when suitably sweetened it can be used as confectionery. In each type there are many varieties which vary greatly in colour of the grain, height and vigour of the

plant, number of tillers, ability to withstand heat and cold, and so on, but all these differences are subsidiary to the characters of the grain which serve as the basis for the main classification. It was estimated (BAKER and GUNUNG, 1938) that some ninety-seven million acres of Maize are grown annually in the United States, and besides this there are great areas of production in South America, South Africa, India and the Danubian countries. In the United States the crop is used chiefly for pig, cattle and horse feeding and also for the production of flour, oil, corn syrup and breakfast foods. The enormous acreage grown is made up almost entirely of the two starchy types, Flint and Dent. Sweet Corn only occupies about half a million acres of the total, but it is an important market garden crop. It is picked in an immature condition when the husks are still green and the grains have passed from the watery stage into the milk stage but have not yet entered the dough stage. The starchy types can also be eaten in an immature condition, but have not the quality and sweetness for which Sweet Corn is bred and selected, and very soon become tough. In England, where Sweet Corn is such a new crop, there has been confusion as to the uses of the different types. This is unfortunate, especially as Sweet Corn and the starchy types look much the same when offered for sale in the green condition. The result is that those trying 'Corn' for the first time form a poor opinion of it if given Dent or Flint instead of the true Sweet Corn. Growers complain that the market is being spoiled by those who push starchy Maize in place of Sweet Corn to the disappointment and detriment of an innocent public. In the United States the Dent type is only eaten to any extent in the southern states, where the climate is too hot for the more tender Sweet Corn to survive. Elsewhere, in the great corn producing states, it is mostly fed to pigs. In South Africa, too, Dent and Flint varieties are eaten as human food, particularly by the natives, to whom "mealies" is the staple article of diet.

Another point of confusion, this time between the Americans and ourselves, is in the naming of the edible portion of the Sweet Corn plant. The Americans are botanically more correct and speak of the whole female inflorescence as the ear, with its husks surrounding the kernels or grains, which in turn are attached to the cob. After eating the grains they throw away the cob. We in this country have caught on the phrase "corn on the cob" and given the whole ear the name of cob, and this description has probably come to stay. The disadvantage is that we are left with no common word for the central spindle or rachis.

Those who have grown Sweet Corn will know that the plant is monoecious, that is, the sexes are in separate flowers on the same plant. At the top of the plant is the so-called tassel, the branched male inflorescence from which the anthers hang and shed their pollen. Lower down the stem is the female inflorescence or ear which grows out as a side branch in the axil of a leaf and is enclosed in tightly folded sheathing leaves (husks). The female flowers are usually arranged in regular rows and from each ovule a long stigma grows up and hangs out at the tip of the husks to form the so-called silks. Pollen is blown by the wind, and though most is inevitably lost on the ground and the leaves, any falling on the silks germinates quickly and carries the male nucleus down the length of the silk to the egg cell. The method of pollination is important. Because of the wind, the silks of any given plant are largely pollinated by pollen from other neighbouring plants so that there is always a large amount of outcrossing and little inbreeding.

As a result, there is a considerable amount of variation from one plant to another. The same can be seen in Rye, which is wind pollinated, whilst in Wheat, Oats and Barley, which are almost entirely self-pollinated, there is very little variation. All the old varieties of Maize and Sweet Corn were selected by the grower to suit his ideas and individual requirements and became adapted to the soil and climate of the district in which they were grown. They were maintained by mass selection, that is, the farmer or seedsman went through his field at harvest time and picked out a number of extra good ears from which he would save seed to be bulked together for the next season's crop. Varieties maintained by mass selection are referred to as open-pollinated varieties because there is no restriction placed on the source of the pollen falling on the silks of selected "cobs." Now although a great deal of trueness to type can be achieved by this method, there is always a certain amount of variation which cannot be eliminated. There may be variation in any of the heritable characters of the plant such as number of ears on the stalk, number of tillers (side shoots from the base), number of rows of grain, protein content, size of plant, and worst of all, although outstandingly good plants occur, outstandingly bad ones also turn up, some of which are quite barren. This state of affairs is tolerated to-day in Britain with several cross-pollinated crops, e.g., the Brassicas, but it did not satisfy the progressive American with his zeal for standardization, mechanical harvesting and desire to get a return from every plant grown. In the case of Sweet Corn he likes to clear the crop in two pickings. Also, a high degree of uniformity is required by the canning industry.

It was noticed last century by DARWIN and others that an increase in yield often occurred when Maize was cross-pollinated compared with the result from self-pollination. The intercrossing of varieties was tried out in America as early as 1876 (BEAL), and though increased yields were obtained, no scientific interpretation of the matter was given until SHULL carried out his investigations on inbreeding and hybridization of Maize (1908, 1909). The practical result of his work was the suggestion of an entirely new method of Maize breeding. His idea was to produce inbred lines by self-pollination, and then cross the best of these to obtain vigorous hybrid offspring. The inbred lines were to be selected not entirely on the basis of their own yield and characteristics, but from the results of combining them one with another. When inbred lines are produced, the vigour decreases with each successive generation of enforced inbreeding. Many of the lines become infertile during the inbreeding process and are too weak to survive. In the lines which do survive there is very little variation from one plant to another. As a result of his work, SHULL dispelled the notion current at the time that inbreeding in itself is a harmful process resulting in permanent deterioration, because when inbred lines were crossed together the resulting hybrid could be more vigorous and higher yielding than the average of the open-pollinated varieties from which the original plants were taken and self-pollinated. Moreover, when an inbred line has reached the inbreeding minimum it can, broadly speaking, only pass on one set of heritable characters so that when two such lines are crossed the offspring is as uniform from plant to plant as each of the parent lines. Such a first generation hybrid presents a great advance upon the variable open-pollinated variety, and if the parents are suitably chosen, the advantages are not only increased yield and uniformity but also resistance to disease, wind and drought.

At first, one might say for twenty years, it was doubted whether this scheme of plant-breeding could ever be put into commercial practice. In the case of Maize it is simple enough to cross the parents in the field for, as already mentioned, the sexes are separate on each plant and the intended females can be emasculated without much trouble. The parent inbred lines were planted in alternate rows and subsequently the tassels of parent A were removed so that pollen from B fell on the silks of A and produced hybrid seed on A. However, since A was a relatively weak inbred line, the *quantity* of hybrid seed harvested was small compared with that obtained from an open-pollinated crop. Later, however, various devices were adopted for increasing the quantity of hybrid seed, if with some sacrifice of uniformity in the resulting crop. There are now several types of cross in use, namely, if inbred lines are indicated by capital letters :

$A \times B$	Single cross
$(A \times B) \times C$	Three way cross
$(A \times B) \times (C \times D)$	Double cross
Open pollinated variety $\times A$	Top cross

The single cross gives the most uniform progeny, but owing to the relative weakness and low yield of inbred parents the seed is expensive to produce. Sweet Corn seed is more valuable than seed of starchy Maize, however, and it has been found possible to produce it economically by the single cross method on a large scale. In all the other crosses a more vigorous female is used resulting in a higher yield of hybrid seed. In the case of the double cross both female and male are vigorous first generation hybrids, thus ensuring not only a good yield of seed on the female parent but also a good supply of pollen from the male. The yield of hybrid seed is also increased by growing two, three or four rows of the female parent to every row of male.

Judging from the estimates given for the United States just before the war it is probable that about ninety per cent. of the Sweet Corn and something approaching fifty per cent. of the starchy Maize grown there is now raised from hybrid seed. The Sweet Corn hybrids are mostly top crosses and single crosses with a marked tendency for the former to be superseded by the latter. The Flint and Dent hybrids are mostly double crosses.

The hybrids will not breed true and seed must be produced afresh each year by crossing. If seed is saved on the hybrid plants the recombination of factors which takes place results in a lower yield and loss of uniformity in the following crop. In common language, the hybrid breaks up.

The investigations at the John Innes Institution started in 1935.* In Sweet Corn, early maturity is closely correlated with low yield, so that in attempting to produce an early maturing variety the aim is to combine the two opposites earliness and high yield in the best possible way. Extensive trials were carried out with hybrid and open-pollinated varieties from as many different sources in Canada and the United States as possible. Inbreeding and selection were also carried out and each year many new experimental crosses were made. Taking all points into consideration the best results were obtained among the early varieties by a new top cross produced by crossing 'Canada Gold' with the inbred 'C 13.'

'Canada Gold' is an open-pollinated variety with a pleasantly

* Aided by a grant from the Agricultural Research Council 1936-40.

shaped ear with 8-12 rows of yellow grain. 'C 13' is an early dwarf inbred line with a fat ear borne low down on the stem and was obtained by JONES and SINGLETON in America by inbreeding and selecting from the variety 'Early Market.' In the United States it has an additional advantage in being resistant to bacterial wilt, transmitting this character as a dominant to its offspring, so that should this disease ever occur in England there is every likelihood of first generation hybrids with 'C 13' being resistant.

The qualities of 'Canada Gold \times C 13' were brought out well in the trial of 1940 (Tables I and II). The outdoor sown trials of 1939 were badly attacked by frit fly, which hampered observation and made measurements almost impossible. Accordingly the plants for the 1940 trial were raised in pots in cold frames and later transplanted, for experience had shown that by keeping the lights on the frames during the early stages of growth a very good control of frit fly can be obtained. After elimination of many varieties and crosses in previous years there remained twelve kinds which were thought worth a detailed trial. Seed was sown on May 2, and when the plants were thoroughly hardened off they were planted out on June 5 at Cobham, Surrey. The varieties were planted in five blocks on the randomized block principle. There were twenty-five plants in each plot and a total of 125 plants of each variety in the trial. The rows were three feet apart with eighteen inches between the plants and the whole experiment was surrounded by Sweet Corn grown for market.

At the time of planting out and during the ensuing growing period the weather was hot and there was a severe drought. Added to the effect of the drought was the fact that the plants had become somewhat pot-bound before they could be put out. These two factors depressed the height and yield of the plants and should be taken into account on examining the results of the trial.

The relative earliness of the varieties can be seen from the distribution of cropping (Table I). Marketable ears were first picked on August 8. They were picked as they reached the eating stage, graded and counted. After the shank had been trimmed, the total weight of marketable ears in the husks was taken, the length of each ear measured and the row number counted. Picking was done twice a week at three and four day intervals.

TABLE I.—Distribution of Cropping—1940.

Variety	August						September				Total number of ears.
	8	12	15	19	22	26	29	2	5	10	
Canada Gold	20	45	23	40	16	4					148
E. E. Bantam	6	34	20	86	16	7					169
E. G. Sweet \times C 13	22	71	30	17	13	1					154
Canada Gold \times C 13	21	81	19	23	19						163
Dorinny \times C 13	20	62	33	32	18						165
E. E. Bantam \times C 13	14	45	26	57	21	1					164
E. E. Bantam \times C 6				60	2						190
Portcross 100 \times L 135 . . .		5	123		89	20					183
Sencross 39				74	12	80	67	27	3	3	192
P 39 \times C 2					1	92	93	34	8	4	232
Whipple's E. Y. \times P 39 . .						28	72	70	20	4	194
Golden Cross Bantam							33	114	36	16	199

The data collected from the 1940 trial are summarized in Table II. The "mean" cropping date given is only approximate owing to the unequal interval between pickings. The data in the third, fourth, fifth, and sixth columns were examined by the analysis of variance

TABLE II.

Variety	"Mean" cropping date	Yield of marketable ears per plant lbs.	Number marketable ears per plant	Number first grade ears per plant	Mean length of ear, cm.	Distribution of row number.							
						8	10	12	14	16	18	irregular	
Canada Gold	Aug. 15	0.54	1.18	0.73	16.6	72	44	31					
E. E. Bantam	" 17	0.54	1.35	0.71	16.4	123	39	4					1
E. G. Sweet \times C 13	" 14	0.62	1.23	0.84	16.5	51	44	57					
Canada Gold \times C 13	" 14	0.71	1.30	0.95	16.7	36	37	88					
Dorinny \times C 13	" 15	0.56	1.32	0.62	15.3	78	51	35					
E. E. Bantam \times C 13	" 16	0.65	1.31	0.85	16.3	54	51	57					1
E. E. Bantam \times C 6	" 16	0.74	1.52	0.83	16.1	65	61	63					1
(Portcross 100) \times L 135	" 21	0.86	1.46	0.78	16.3	17	64	94		7			
Senecross 39	" 28	0.99	1.54	1.12	17.1	3	12	126		36	7		3
P 39 \times C 2	" 29	1.12	1.86	1.34	16.7		7	113		82	26		5
Whipple's E. Y. \times P 39	" 31	0.97	1.55	1.04	17.8					56	17		5
Golden Cross Bantam	Sept. 3	0.83	1.59	0.67	17.3	28	75	76	11	1			6
Difference between two means required for significant difference													
(P = 0.05)		0.128	0.214	0.157	0.335								

and the figure given at the bottom of each of these columns can be used to judge whether differences between means of varieties are significant. If two means differ by an amount equal to or greater than the figure at the bottom of the column they can be considered significantly different.

From Table I it can be seen that there is an early group of varieties with "mean" cropping date from August 14-17. This is followed by 'Portcross 100 \times L 135' with "mean" cropping date at August 21. The remaining four varieties form a late group with "mean" cropping dates from August 28-September 3.

It will be noticed that the two open-pollinated varieties 'Canada Gold' and 'Extra Early Bantam' fall within the early group and have relatively low yields. The hybrids between them and 'C 13' are of interest because previous trials had shown them to be promising early maturing hybrids. The yield of 'Canada Gold \times C 13' is significantly greater than that of its open-pollinated parent. The improvement in yield of 'E. E. Bantam \times C 13' over its open-pollinated parent is not quite significant. In the case of 'Canada Gold' and its hybrid with 'C 13' it is important to note that there is no significant difference between the total number of marketable ears of the two varieties, *but the hybrid has a significantly greater number of first grade ears*. This shows that the improvement on crossing with 'C 13' has been to increase the size and quality of the ears rather than to increase their number. The same is probably true of 'E. E. Bantam' and its hybrid, but here the increased number of first grade ears is not quite significant ($P = 0.1 - 0.05$). This brings out the good qualities of the inbred 'C 13' as a parent for early Sweet Corn hybrids for cultivation in southern England. From the market point of view it is better to have one or two large ears on a plant than an increased number of smaller ones.

Comparing the two top crosses 'E. E. Bantam \times C 13' and 'Canada Gold \times C 13' and taking all characters into consideration, the hybrid with 'Canada Gold' is superior to the hybrid with 'E. E. Bantam.' This is not brought out well in Table II for the time of maturity of the two top crosses is about the same and the difference in yield in favour of 'Canada Gold \times C 13' is not significant, but 'Canada Gold \times C 13' is more uniform from plant to plant and has a stouter ear of better shape. Also, in making these two top crosses a greater yield of seed is obtained on 'Canada Gold' than on

'E. E. Bantam.' Hence, 'Canada Gold \times C 13' can be considered the best in the early group of varieties.

The later variety 'Portcross 100 \times L 135' has a long ear of good shape and gave a significantly greater yield than 'Canada Gold \times C 13,' but unfortunately it is not available commercially. Taking all points into consideration, 'Sencross 39' can be recommended as the best variety in the trial to follow 'Canada Gold \times C 13.' It is a top cross produced by crossing 'Early Yellow Sensation' with 'Purdue 39.' It is surprising that it gave a significantly greater yield than the later variety 'Golden Cross Bantam,' for in all other trials, both before and since, the reverse has been the case. 'Golden Cross Bantam' is a very vigorous hybrid and for this reason it probably became more pot-bound and then suffered a greater check than the other varieties on transplanting. 'Golden Cross Bantam' had its "mean" cropping date five days later than 'Sencross 39' and in spite of the yield result in this trial it can be recommended to follow 'Sencross 39' in our climate. It is, however, as late a variety as we shall want to grow. In the United States 'Golden Cross Bantam' is classed as a mid-season variety and is one of the most widely grown hybrids. It is a single cross of good quality produced by crossing inbred lines known as 'Purdue 39' and 'Purdue 51,' and though only introduced in 1932 by Dr. GLENN M. SMITH it came at a time when great devastation had been caused by bacterial wilt in open-pollinated varieties. Its resistance attracted widespread attention, not only to the variety itself, but to the inbred line method of breeding. The popularity achieved by 'Golden Cross Bantam' was so great that in 1935, three years after its introduction, a million pounds of seed of it are said to have been produced and a figure of this order has been maintained ever since. In this country further observation will be necessary before it can be said that 'Golden Cross Bantam' is the perfect late variety. I have noticed that in some seasons it produces a few anthers between the grains at the tip of the "cob," and there is also sometimes a tendency to produce a few branched ears in the first position on the main stem. In the 1940 trial the hybrid 'P 39 \times C 2' was the heaviest yielder, but it is too coarse in quality to be recommended and also, as far as I am aware, it is not available commercially.

The first quantity of seed of the new hybrid 'Canada Gold \times C 13' was produced at the John Innes Institution in 1940 (Fig. 40). Since then the variety has been widely grown in the southern half of England and good results have been obtained with it during the seasons 1941-44. Following the American practice of naming Sweet Corn hybrids by combining the names of the parents I gave it the name 'Canada Cross 13' and the seed produced in Merton was first offered by Messrs. A. L. TOZER, Ltd., in the trade journals of the spring of 1941. The 13 was subsequently dropped for the sake of simplicity. The John Innes Institution continued to raise the hybrid seed on as large a scale as was practicable and Messrs. CARTERS TESTED SEEDS, Ltd., offered it as 'John Innes Hybrid' in their catalogue of 1942.

Cultivation.—Sweet Corn will grow well on a variety of soils provided they are in good heart and neither too heavy nor too light. There is some discussion among growers as to whether it should be treated generously or not. As far as I know, there have been no accurate manurial experiments with Sweet Corn carried out in this country. It is certain that too much moisture and too much nitrogen

will produce an unnecessary abundance of green leaf on the plant, and so I should be content to grow Sweet Corn on land dunged or composted for a previous crop and use a good dressing of a general artificial fertilizer before sowing. On very light land it might be advisable to grow the crop on dung or compost. No accurate spacing experiments have been carried out in this country, but for 'Canada Cross' two or three seeds can be dibbed in 15 or 18 inches apart with 2 feet 6 inches between the rows. Some growers have the rows 2 feet apart, but this does not allow inter-row cultivation for so long a period. With regard to the time of sowing there is some difference of opinion. For under cloches or sowing in pots in a cold frame the last days of April up to May 1 can be recommended so that the plants can be "de-cloched," or planted out, at the end of May. For outdoor sowing the American practice is to allow the soil to warm up first, and hence I prefer mid-May for southern England. Some growers sow May 5-10 in early districts and I have also heard of April sowing outdoors. Sweet Corn will survive a certain amount of frost in its early stages but I can see no advantage in keeping a warmth-loving plant almost stationary in cold weather and a prey to pests.

Many growers ask if they should remove the tillers, which appear to be unproductive and hence wasteful. It would take several years detailed experiment to decide this point and I can only state that the same problem arose in the United States and was examined thoroughly, in one case over a period of six years (DUNGAN, 1931; THOMSON, MILLS and WESSELS, 1930). The conclusion reached was that removal of tillers had no beneficial effect and in some cases was definitely harmful. Hence I prefer to leave the plants alone.

As regards pests and diseases we are fortunate in this country in having no corn borer and no corn ear worm. Both are serious pests in the United States. Rooks can be troublesome in England and if not kept off by one device or another can pull up seedlings by the thousand in the space of a few hours. Smut, a bad fungus disease, appeared at the John Innes Institution in 1937, and though normally said to be soil-borne must have come over originally on infected seed. Should it appear at other places there is no other remedy, apart from breeding resistant varieties, than to carry out a proper crop rotation with a lapse of several years before re-cropping with Sweet Corn. The chief trouble with which we have to contend is the frit fly. This is normally a pest of Oats and some of the common herbage grasses, and is very widespread. The fly is active in May and lays its eggs on the soil around young seedlings soon after they appear above ground and the larvæ which hatch out penetrate the plant and feed on the soft tissues near the growing point. The first two or three leaves are often normal, but the later ones emerge darker in colour, twisted, stunted, and rolled at the tip. If the growing point is badly attacked the main stem may be entirely absent. The plants remain stationary for a fortnight or more, and after this check tiller growth replaces that of the main stem. Unfortunately, "cobs" formed on the tillers are neither so good nor so early as those on the main stem. If there has been no attack by the time five to six leaves have unfolded, the plant can be considered safe and the success of the crop can be closely estimated at this stage. It is best to sow seed as liberally as possible and thin out any attacked plants at the five-six leaf stage. I have not found any repellent to be of use but have some evidence that a puff of calomel dust around each seedling or along the rows will give a measure

of control against frit. On a small scale, sowing under glass in pots or under cloches will give good protection, but on no account must plants be raised in boxes and transplanted as they suffer enormously from root damage. Even when transplanted from pots the yield is never as great as when seed is sown directly outdoors. I have been told that I exaggerate the frit fly danger and its effects, and certainly this pest should not deter one from growing Sweet Corn. However, I feel that frit fly must be mentioned so that growers can make their own observations and will not blame the variety for any abnormal plants which they may find. The fact that there is a pest which needs controlling points the way to further research, and it is hoped that entomologists will take up the problem. Perhaps some of the newer insecticides will be found effective.

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BORDER CARNATIONS AT WISLEY, 1944.

ONE hundred and eighteen varieties of Border Carnations were grown at Wisley in 1944 ; of these **Cottage Claret** (Allwood), **Cottage Ruby** (Allwood), **Doreen Clove** (Rumley), **Dawn Glory** (Allwood), **Fancy Monarch** (Allwood) and **Esse** (Rumley) were grown for the first time.

The Joint Committee of the Royal Horticultural Society and the National Carnation and Picotee Society met at Wisley on July 25, 1944, and made their recommendations for Awards as given below. They also recommended that the plants in the trials be discarded, and that new stock, well rooted layers, be obtained in the autumn and that the trial remain for two years before being finally judged. In two years' time—1946—new stock be procured from raisers and the trade.

PINK SELFS.

Cottage Pink (raised and sent by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex). C. July 25, 1944.—20 inches. Plant very vigorous, bushy habit ; flower stems rigid. Flowers $2\frac{1}{2}$ inches diameter, freely produced, a tone paler than French Rose (H.C.C. 520/3) ; petals broad, very slightly cut ; calyx strong.

Cottage Wonder (raised and sent by Messrs. Allwood Bros.). C. July 25, 1944.—18 inches. Plant vigorous, of compact habit ; flower stems stout and rigid. Flowers $2\frac{1}{2}$ inches diameter, full centred, bright rosy-cerise ; petals broad, entire ; calyx strong.

APRICOT SELF.

Cottage Apricot (raised and sent by Messrs. Allwood Bros.). H.C. July 25, 1944.—See R.H.S. JOURNAL, 68, p. 33 (C. 1942).

BOOK NOTES.

"Catalogue of the Vascular Plants of S. Tomé." By A. W. Exell. Large 8vo. 428 pp. Illus. (Printed by order of the Trustees of the British Museum, 1944.) £1 10s.

The author took part in an expedition to the Islands of the Gulf of Guinea—S. Tomé, Príncipe and Annobon—in 1932 and 1933 with the object of investigating the flora, which is of particular interest because the history of these islands is known. They are of volcanic origin, and have never been connected with the mainland; they were first discovered in 1470, when they were found to be uninhabited. From that time on portions of them were cultivated, but the crops grown and the methods adopted are more or less on record. No botanical work was done until 1822, when George Don visited S. Tomé under the auspices of the Horticultural Society of London; he does not appear to have penetrated far into the virgin forest, as he records that "the Island is nearly destitute of Orchidea," although over 70 species are listed in the present work. Other botanists visited one or all the islands at various times, and in 1880 the Portuguese became interested and a series of investigations were undertaken under the direction of Professor Julio Henriques, who later published a general account of S. Tomé. The material collected during Mr. Exell's visit has been compared with that recorded earlier, and in this he has had the assistance of colleagues at the British Museum and at Kew. The Systematic List, together with the chapters on the history, physical features and origin and affinities of the flora, is a valuable contribution to the study of island floras; as would be expected, a number of endemic species, genera and even families exist, thus providing new, authenticated material for the study of the evolution of species, which can best be followed in limited areas where destruction of the original flora by man has not been great, or, at least, its probable extent fairly well understood.

"British Botanists." By John Gilmour. 4to. 48 pp. Illus. (Wm. Collins, London, 1944.) 4s. 6d.

From the middle of the sixteenth century when William Turner, the "Father of British Botany," produced his *New Herball*, up to the twentieth century, is a wide field to cover in so small a compass as the present volume, which forms one of the series "Britain in Pictures," but Mr. Gilmour has made a good and fair choice of the men most worthy of commemoration, and presents, through their lives, the history of botany in England. The illustrations are reproductions from works of historical interest, those in black and white being very satisfactory, though the quality of the coloured plates is not so uniform.

"Gardener's Earth." By S. B. Whitehead. 8vo. 226 pp. Illus. (J. M. Dent & Sons, Ltd., 1945.) 7s. 6d.

This is a thorough but a simple exposition of the problems of the soil—physical, chemical and biological—from the gardener's point of view. As in the author's previous book "Brush up your Gardening," the reason for the various operations is given, a method that appeals to many learners better than the didactic. The general management of different types of soil, fertilizing and composting as well as signs of soil deficiencies and pests, are dealt with. The book concludes with a useful bibliography for further reading and is well illustrated with line drawings and photographs.

Books noted in this JOURNAL can be obtained direct from the publishers or through any bookseller; the R.H. Society's Office supplies only those books and pamphlets which have been issued by the Society.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part 5

May 1945

THE SECRETARY'S PAGE.

Programme of Meetings.—Meetings with Shows will be held in May as follows :

Tuesday, May 1	12 noon—5 P.M.
Tuesday, May 15.	12 noon—5 P.M.
Tuesday, May 29	12 noon—5 P.M.
Wednesday, May 30	10 A.M.—5 P.M.
Thursday, May 31	10 A.M.—5 P.M.

In conjunction with the Show on May 1, there will be a competition for Rhododendrons, the schedules being obtainable from the Secretary ; and the Alpine Garden Society will hold its Spring Show on this date. On May 15 there will be a competition for Flowering Trees and Shrubs and a Sewell Medal Competition for Alpines ; particulars can be obtained from the Secretary. The Iris Society's Show will be held on May 29—31.

A lecture on " Some Rare Alpines " will be given by Dr. P. L. GIUSEPPI at 2.30 P.M. on Tuesday, May 15, in the Lecture Room of the New Hall, and on Tuesday, May 29, at 2.30 P.M., Miss L. F. PESEL will lecture on " Irises for the Little Garden."

There will be a Meeting with a Show on Tuesday, June 19 (12 noon—5 P.M.), when there will be competitions for Flowering Shrubs, particulars of which can be obtained on application to the Secretary.

A lecture on " The Rose Garden after the War " will be given by Mr. COURTNEY PAGE at 2.30 P.M. in the Lecture Room of the New Hall on Tuesday, June 19.

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during May and June :

Vegetable Garden.

May 2, 3	Control of Vegetable Pests and Diseases	2—4 P.M.
May 16, 17	Thinning, Transplanting and Successional Cropping	2—4 P.M.

Flower Garden.

June 6, 7 . . . Summer Pruning of Shrubs 2-4 P.M.

Fellows and Associates who desire to attend are requested to notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

How to get to Wisley.—Fellows and Associates desiring to travel from London to Wisley should take a train from Waterloo to Esher and there pick up the 'bus No. 215, which will stop on request at the turning for the Gardens on the Portsmouth Road. For the times of the 'bus No. 215, inquiries should be made at the London Passenger Transport Board, 55 Broadway, London, S.W. 1 (Tel. : Abbey 1234), and for particulars of the trains, the current time-table should be consulted or inquiries made at Waterloo Station (Tel. : Waterloo 5100).

Rose Show.—The National Rose Society will be holding a Show in the Society's Old Hall on Friday, June 29 (12 noon-6 P.M.), and Fellows will be admitted free of charge.

Advice on Technical Subjects.—All requests for horticultural advice, advice on diseases, soils and manures, and for the identification of plants, should be addressed to the Director of the R.H.S. Gardens, Wisley, near Ripley, Surrey. All fruits for naming should also be sent to the Director of the Society's Gardens at Wisley.

Lindley Library.—The Library is open daily (Sundays and holidays excepted) from 10 A.M.-5 P.M. (Saturdays 10 A.M.-12.30 P.M.). Anyone requiring the loan of a book by post must make written application to the Secretary, and loans will be granted under certain conditions, but all books borrowed must be returned to the Library in good condition within one month from the date of issue.

Queen's Institute of District Nursing Gardens Scheme.—We are asked by the Queen's Institute of District Nursing to call attention to the following :

" Gardens Scheme.

" Do not miss visiting the many gardens that have kindly promised to open under the Queen's Institute of District Nursing Gardens Scheme during the coming spring and summer for the benefit of district nursing. Lists can be obtained from the Gardens Secretary, 57 Lower Belgrave Street, London, S.W. 1."

WISLEY IN MAY.

At no time of the year are the Gardens at Wisley more delightful than in the present month. Rhododendrons, Azaleas, Lilacs and Magnolias are of special interest ; and there is also a considerable variety of other flowering shrubs, as well as much that will please lovers of herbaceous and alpine plants. This prediction is made with reserve, lest there should be a repetition of last year's misfortune, when a single frost in the first week of May destroyed almost every flower and much of the young foliage of the plants mentioned.

Some choice plants are to be found on or near the walls of the Laboratory. Several varieties of *Camellia japonica* flower for some weeks on the east side together with the orange-red *Lonicera ciliosa* and *Hydrangea petiolaris*, whose self-clinging growths drape the wall with bright foliage and flat, creamy panicles. Just inside the main

gates the evergreen *Ceanothus rigidus* will be covered with deep blue flowers, although *C. dentatus*, a few yards away, was killed by winter frosts. The blush-pink Rose 'Belle of Portugal,' a hybrid of *Rosa gigantea*, has outgrown the sheltered alcove which formerly protected its early flowers, and the more richly coloured 'Chateau Eleanore' is almost equally vigorous. On the west side there are pink and crimson Tree Pæonies, *Clematis macropetala*, *C. montana*, and *Actinidia kolomikta*, modestly hiding sweetly scented white flowers among silver-tipped leaves which become rose-coloured as the season advances. On the wall facing the Iris collection some good Honeysuckles, including the large, yellow hybrid *Lonicera Tellmanniana*, *L. sempervirens* in red and the cream and rose *L. italica*, may be seen. Close by, *Ceanothus Lobbianus*, *C.* 'Delight' and the white-flowered evergreen *C. incanus* survived the winter, but among their neighbours *Acacia dealbata* and *Buddleia auriculata* succumbed. *Clematis balearica* on the same wall was quite undisturbed and flowered freely through February and March; *Cytisus Battandieri* and *Fremontia mexicana*, although cut, are now flowering brightly again.

It is but a few steps from here to the Wild garden, where the Rhododendrons and Azaleas form the chief attraction; but to some visitors the immaculate flowers and fresh foliage of the Magnolias will afford even greater satisfaction. Most members of the Soulangeana group are over, but *M. Lennei* usually produces a longer succession of huge, purple-stained blooms, supplemented by the nodding flowers of *M. sinensis*, *M. Wilsonii* and *M. Sieboldii*. Late in the month *M. Watsonii* makes its contribution, diffusing a lemon-like odour almost too powerful to be pleasant at close quarters. The graceful members of the genus *Enkianthus*, adorned with innumerable rosy or cream-coloured bells, are conspicuous now, and some other outstanding woody plants are *Cornus florida rubra* with tiered sprays of rose-bracted flower-heads, *Styrax japonicus*, one of the most elegant of small trees, neat of leaf and most liberal in its display of white blossoms, *Embothrium lanceolatum* with flame-coloured clusters, *Kalmia latifolia*, the 'Calico Bush,' a shapely evergreen with posies of exquisitely formed pink flowers, and *Stewartia serrata*, bearing Camellia-like, white blooms. Primulas, including such species as *P. japonica*, *P. pulverulenta* and *P. helodoxa*, as well as multi-coloured hybrids, are abundant everywhere; these, in company with the yellow and orange Welsh Poppies, Bluebells, Lilies-of-the-Valley, species of *Polygonatum* and *Orchis maculata*, form a gaily coloured carpet beneath the shrubs.

For the largest collection of Rhododendrons the visitor must turn to Battleston Hill. In addition to the many species still flowering, there is a wide range of garden varieties in all possible colours, including many compact-growing, floriferous plants eminently suitable for the smaller garden. Here, too, is a good selection of hybrid Azaleas of the large-flowered 'mollis' type as well as the popular dwarf varieties of *Rhododendron obtusum*, to which the bright-hued 'Kurume' Azaleas belong.

Howard's Field, at the northern end of the Gardens, is well known to regular visitors as the home of an unusually large collection of Lilacs, which should be at their best during the first half of the month. The first Rose species, *R. Hugonis* and *R. Primula*, will have their wand-like branches wreathed with pale yellow flowers; and the Japanese Quinces, Brooms, species of *Spiraea* and *Lonicera* and other shrubby plants will also be attractive.

The Rock garden is very gay now, with large patches of colour formed by such familiar genera as Phlox, Viola and Lithospermum, late Saxifrages of the mossy section, and *Genista hispanica*. Some individual species of note are *Gentiana pumila*, resembling the popular *G. verna*, *Cynoglossum nervosum* with rich blue sprays, *Chrysanthemum Mawii*, producing many slender-stalked, pink heads, *Roscoea cauleoides*, with primrose-yellow, Orchid-like flowers, *Houstonia coerulea*, forming drifts of pale blue stars, *Lupinus ornatus*, with lavender spikes above tufts of silvery foliage, and *Haberlea rhodopensis*, with spreading lilac sprays arising from dark-leaved rosettes. Moisture-loving Primulas, such as *P. involucrata* and the related mauve *P. yargongensis*, *P. Sieboldii* and several of the Candelabra section are at home in the bog and by the pond-margins. Beside the Wistaria-covered bridge the first violet flowers of *Iris laevigata* are opening.

From the wealth of flowers in the Alpine house it is difficult to select one or another for special mention. Towards the back of the staging on either side of the house large pans of the floriferous dwarf Brooms, *Cytisus kewensis* and *C. Beanii*, small-flowered Azaleas, and forms of *Saxifraga Cotyledon*, from whose symmetrical rosettes arching panicles are already developing, provide a pleasing background for smaller specimens. Lewisias are prominent, and their softly tinted flowers and neat habit always win admiration. The same is true of the Ramondias. Some other plants of merit are *Potentilla megalantha*, with large, Buttercup-yellow flowers and rounded, hairy leaves, *Physaria didymocarpa*, an unusually neat Crucifer with silver-rosetted leaves and short, yellow spikes, *Iris innominata* of the same colour, *Rhodohypoxis Baurii*, covered with starry flowers of carmine, pink or white, *Dianthus simulans*, whose large, solitary, pink blooms are borne just above close cushions of sharply pointed leaves, *Linum elegans*, a pretty, soft yellow Flax not much over six inches tall, and *Iberis Jordani*, a large-flowered Candytuft with short, spreading branches.

GARDEN WORK.

REMINDERS FOR MAY.

Vegetable Garden.—Ground from which late Broccoli and Kale has been cleared can now be dug and well manured in readiness for receiving the Leek crop. Where no provision has yet been made for the Celery crop similar ground would be suitable for taking out the trenches.

During the first week sow seeds of suitable varieties of Onions, such as 'Ebenezer' or some other flat-bulbed variety, to provide sets for planting the following March. About the same period sow Spinach Beet for summer supplies, also make the first sowing of Dwarf French Beans, choosing a sunny position; Haricot Beans, to provide dried seeds for storing, can be treated in a like manner.

Sow Sweet Corn about the middle of the month and make a first sowing of Runner Beans in trenches prepared as previously recommended, also sow Seakale Beet and Beetroot for storing, both round and long types. Towards the end of the month is early enough to sow Vegetable Marrows in the open.

Successional sowings recommended for this month are: during the first week, a further sowing of Cauliflower 'All the Year Round,'

Carrot 'Early Market' and Turnip 'Early Snowball'; about the second week, the last sowing of Savoys, choosing a late variety such as 'Ormskirk Late Green' or 'Latest of All,' and in the third week, a further sowing of Dwarf French Beans, not forgetting the periodical sowings of Peas and Lettuces.

If the planting of maincrop Potatoes has not been completed endeavour to finish this operation as early in the month as possible. The earliest sowings of Brussels Sprouts and early maturing Cabbages and Cauliflowers should be planted out immediately they are large enough. The two last mentioned crops should be placed on ground which has been generously treated with manure.

Should frost threaten draw a little soil over Potato shoots as they appear through the soil, and when the haulms of the earliest Potatoes are about 4 inches high they will need earthing.

Continue to stake Peas as this operation becomes necessary. It is worth while also to support Broad Beans by placing a few stakes at intervals along the rows, running a line of twine from stake to stake. It is a good plan to give these two crops a mulching with strawy manure or garden compost.

Hand weeding of seedling crops should be done in good time; thin, in easy stages to the required distance, seedlings of Beetroot, Carrots, Lettuces, Onions, Parsnips and Turnips as soon as they require it; hoe between the rows immediately these operations are completed.

Keep a watchful eye this month for such pests as Black Aphis on Broad Beans, Carrot Fly, Onion Fly, Cabbage Root Maggot and Turnip Flea Beetle, taking the necessary steps for their immediate destruction.

Fruit Garden.—Choose favourable weather to hoe the Strawberry bed so that the ground will be free of weeds before the straw is laid in position. Raspberry plantations should also be hoed at this time, cutting off all surplus suckers and retaining only sufficient strong, well-placed shoots to supply the necessary canes for next season's crop. Autumn fruiting varieties usually produce many more shoots than are required; this is the time to reduce their number, retaining sufficient of the strongest. Raspberries benefit from a mulching of some suitable material, strawy farmyard manure for preference; garden compost and lawn mowings are good substitutes. If mulching material is available in sufficient quantity this could be used with advantage on Blackcurrants also.

To prevent the fruits from coming in contact with the soil, straw the Strawberry bed just before the flowers open; place the straw well under the plants to form a cushion on which the fruit trusses can lie. Net the bed immediately the fruit has set. Nets should also be placed on Cherry trees on which the fruit is about to ripen.

The beginning of the month is a suitable time to carry out bark-ringing of strong growing Apple and Pear trees which are shy in cropping. Trees of stone fruits should not be bark-ringed.

Early in the month trained Peach and Nectarine trees growing on walls will require their first "disbudding"; towards the latter half of the month, where the above-mentioned trees have set a large number of fruits, treat as recommended for trees in cold greenhouses. Where necessary thin Apricot fruits in a like manner.

In the case of bad attacks of Apple Scab it will be necessary to give a post-blossom spray (i.e. after the petals fall) of Lime Sulphur

at 1 in 100, adding a suitable spreader. 'Lane's Prince Albert,' 'Beauty of Bath,' 'Newton Wonder' and 'Rival' are some of the varieties which are likely to be damaged by Lime Sulphur sprays applied after flowering. 'Cox's Orange Pippin' and 'James Grieve' may suffer to some extent. 'Stirling Castle' should not be sprayed with Lime Sulphur at any strength.

For a bad attack of Pear Scab, substitute Bordeaux Mixture at the "petal-fall" stage, and it will be advisable to repeat this spraying a fortnight later.

Flower Garden.—Where a bedding scheme is carried out, towards the end of the month remove the spring flowering subjects as soon as these have ceased to be effective, taking care of the various bulbous subjects by transferring them to a part of the garden where they can complete their growth and ripen off. Perennial spring flowering plants can be divided and planted out in the reserve garden to make good plants for the following season. Dig over the beds and add humus where this is considered necessary and have all in readiness for planting out in the first week of June, to provide the summer and autumn display.

Preparation for next spring's display should be put in hand by sowing seeds of various biennials for this purpose such as Canterbury Bells, Sweet Williams, Myosotis, Wallflowers, etc. The two first named are better sown in a cold frame during the first half of the month; Myosotis and Wallflowers will do quite well in a prepared seed bed in the open garden, sown later in the month.

On well-drained soils in the southern part of the country in an average season good results can be obtained by sowing Zinnia seeds during the latter part of the month direct in the position in which they are to flower.

Early in the month Early Flowering Chrysanthemums should be ready for planting out on ground which has been well prepared by deep digging and a liberal dressing of farmyard manure if good results are to be obtained. Towards the end of the month pinch out the growing points.

About the middle of the month is a good time to plant Dahlia tubers straight from the store to the open ground. If it is desired to increase the stock, propagation by division can be carried out at the same time.

Hardy annuals sown in March will now require a certain amount of thinning; thin in the first instance to about 2 inches apart and later to the required distance according to the nature of the subject. It is advisable, at the final thinning, to place a few twiggy sticks amongst plants requiring support.

If supports for Sweet Peas are not already in position, this should be done without delay; also start the special training of those plants to be grown as cordons.

May is the month when late spring frosts can be expected and much damage can be done to Liliiums, especially to *L. regale*, which is usually well advanced in growth by this time. If these plants are not already provided with natural protection, some form can be afforded by placing short branches of Common Laurel, or similar material, around the young shoots until all danger of frost is past.

Unheated Greenhouses and Frames.—In the southern part of the country Cauliflowers, Lettuces, Radishes, Spinach and Turnips are often difficult to grow on hot soils in the open garden during summer,

These crops can, however, be grown successfully in frames where rich soil, shade and moisture can be provided. When germination of the seeds has taken place and the plants are well established the frame lights should be removed, but during spells of hot sunshine some form of light shading should be given.

Early in the month sow Vegetable Marrows and Ridge Cucumbers for planting in the garden next month.

Continue to prick out Celery seedlings at about 4 inches apart each way for maincrop and late supplies.

In suitable frames plant Cucumbers (frame), Melons and Self-Blanching Celery to mature in the frames.

To obtain good results from Tomatoes growing in a cold greenhouse or frame, secure sturdy plants about 6 inches high and plant in prepared soil early in the month.

Tomato plants intended for planting in the garden in early June, which have been raised in a warm greenhouse, can be transferred to a cold frame early in the month and gradually hardened off by the last week.

Endeavour to harden other plants such as Cucumbers (ridge), Vegetable Marrows, Begonias, Dahlias, etc., by the end of the month with a view to planting in the garden in the early days of June.

At this time of the year copious supplies of water will be required by crops growing in frames, slight shading in some instances will be necessary and in others the lights can be dispensed with during the daytime when weather conditions are favourable.

To control Mildew on Grape vines, immediately the young shoots are about 4 inches in length (before the flowers are open) dust the shoots and rods with green Sulphur applied through a distributor, covering every portion of the leaves. As soon as these shoots are sufficiently developed pinch out the growing point at two leaves beyond the embryo bunches and to prevent snapping bring these down to the wires in easy stages. Growth will be rapid at this stage and when the vines are in flower endeavour to promote a free circulation of air, at the same time maintaining a fairly high temperature. In order to assist the flowers to set fruit, about mid-day draw the hand gently down the bunches to distribute the pollen. If more than one variety of Grape is growing in the same house cross-pollinate the varieties.

Where Peach and Nectarine trees have set a large number of fruits it is advisable to remove a certain quantity of the surplus as soon as these have reached the size of green Peas; at this stage take off all under-sized ones and, in those instances where two fruits are growing close together, remove the worst placed one. Do not thin too drastically at this period.

In fully developed trees carry out the operation of disbudding a stage further by gradually removing the remainder of the surplus shoots, retaining those referred to in the April notes on this subject. The growths at the apex of the shoots are allowed to grow until they have made five good leaves, then the points are pinched out and all subsequent growths pinched at one leaf. Similar leading growths on young trees should be allowed to develop to their full extent in order to extend the tree, and it is also advisable to retain an intermediate shoot for the purpose of furnishing the space between the main branches.

FLORISTS' FLOWERS.—III.

SWEET PEAS.

By J. C. P. M. DAVIS.

THE common garden name given to the Sweet Pea is far more illuminating than that of *Lathyrus odoratus*, the name given by the botanist. None will dispute that the Sweet Pea is the Queen of Annuals, for no other annual is so widely grown and universally admired. Despite the elusiveness of the true gentian blue and the buttercup yellow, surely no other flower has a wider range of colour. No plants can give such a wealth of cut bloom from one seed, and few cut blooms can travel so well when carefully handled. Although the Sweet Pea has been cultivated in this country for approximately 250 years, for nearly 200 years it remained an insignificant and little grown garden flower.

We are indebted to Mr. S. B. DICKS, F.R.H.S., for our early knowledge of the Sweet Pea, for it was he who discovered the earliest mention of the plant which was catalogued as "*Lathyrus angustifolius, flore albo and rubro variegato, odorato*" in the *Historiae Plantarum* of JOANNES BAUHINUS, Ebroduni, 1650–51. While it is interesting to note that JOHN RAY in his *Historia Plantarum* 1686–1704, mentions "*Lathyrus major e Siciliae*; a very sweet-scented Sicilian flower with red standard; the lip-like petals surrounding the keel are pale blue. Its seed pod is hairy." An Italian priest, Father FRANCISCUS CUPANI, in his *Syllabus Plantarum Siciliae* published at Palermo in 1695, used the lengthy nomenclature "*Lathyrus distoplatyphyllos hirsutis, mollis, magno et peramoeno flore odoratissimo purpureo*."

It was in the last year of the seventeenth century that the cultivation of the Sweet Pea commenced in England, when CUPANI sent some seeds to Dr. UVEDALE, Master of the Foundation School, Enfield. PHILIP MILLER, F.R.S., undoubtedly refers to Dr. UVEDALE in his *Gardener's Dictionary* first published in 1731, as "Dr. Udal, of Enfield, a curious collector and introducer of many rare exoticks, plants and flowers." It was in the seventh edition of this work published in 1759 that PHILIP MILLER flatly contradicted the testimony of all the writers that preceded him. He ascribed the plant as a native of Ceylon, and to his credit it must be stated that several leading botanists of the eighteenth century supported his assertion.

The first illustration of the plant appeared in the *Horti-Medici, Amstelodamensis* in 1697–1701, again as a result of seed sent by the Sicilian monk, CUPANI, to CASPAR COMMELIN of Amsterdam. While the first coloured illustration is traced in 1730 to *Twelve Months of Flowers*, a work "designed by PETER CASTEELS, from the collection of ROBERT FURBER, gardener at Kensington and engraved by H. FLETCHER." It was the same ROBERT FURBER who made the first trade offer of Sweet Peas, this was restricted to a purple variety.

The first variety to be awarded a First Class Certificate by the Royal Horticultural Society was 'Scarlet Invincible' on July 11, 1865. The raiser was Mr. STEPHEN BROWN, of Sudbury, and the colour was nearer carmine than scarlet. Mr. THOMAS LAXTON in 1883 received a First Class Certificate for his 'Invincible Carmine,' this being the first recorded result of cross-fertilization.

It was in 1870 that Mr. HENRY ECKFORD accepted Dr. SANKEY'S invitation to take charge of his gardens at Sandywell, Gloucester, with a view of raising new seedlings of florist's flowers. In the previous fifteen years Mr. ECKFORD, as head gardener to the Earl of RADNOR, had successfully raised many new Verbenas, Pelargoniums and Dahlias. Before Mr. ECKFORD'S day there were many devotees and since there has been a long succession, who have achieved great results, but one and all would call HENRY ECKFORD the Maestro.

HENRY ECKFORD realising the great possibilities of developing the Sweet Pea set to work patiently at his cross-fertilization and fixing of new varieties. For it was not until 1882 that his first variety—'Bronze Prince'—was introduced to the public by Mr. WILLIAM BULL, of Chelsea. For the next twenty-three years Mr. ECKFORD continued to introduce varieties which widened the range of colour, enlarged the flowers and improved the form, without robbing it of its fragrance.

By now the Sweet Pea had obtained such a hold on the public imagination that in 1900 the National Sweet Pea Society was instituted. The Society's first show held on July 25, 1901, in the Royal Aquarium, Westminster, marked a new era, by the showing of 'Countess Spencer'—a shell pink—the first frilled and waved variety and the progenitor of practically all modern varieties of Sweet Pea.

'Countess Spencer' was exhibited and raised by Mr. SILAS COLE, then gardener to EARL SPENCER at Althorp Park, Northampton. In 1898 Mr. Cole crossed 'Lovely' and 'Triumph,' and one of the resultant seedlings he crossed with 'Prima Donna,' which in turn produced the original plant of 'Countess Spencer,' of which he saved only five seeds. Mr. ROBERT SYDENHAM, of Birmingham, bought the stock and sent it to California for cultivation of seed. Unfortunately the variety was not fixed and, when distributed, variations were legion.

At the same time as 'Countess Spencer' was raised in Althorp Park, it appeared without artificial crossing in rows of 'Prima Donna,' with Mr. W. J. UNWIN at Histon and Mr. ECKFORD. Mr. ECKFORD did not name his seedling, but sold it as 'Countess Spencer.' Mr. UNWIN named his seedling 'Gladys Unwin,' which though smaller, less waved and slightly paler than 'Countess Spencer,' had the great advantage of being true, and was later the parent of a not inconsiderable number of descendants.

During the past forty years, the Sweet Pea has continued to improve and possibly as many as 3,000 varieties have been introduced, so I feel in the small space available for this article that an injustice would be done to many if I attempted to single out any of the famous people who have and are still devoting themselves to the progress of this flower. But I feel a greater injustice would be done if this article did not mention some of the present-day raisers to whom we owe so much, such as Messrs. ROBERT BOLTON & SON, JAMES CARTER & CO., H. J. DAMERUM, DOBBIE & CO., LTD., E. W. KING & CO., LTD., RYDER & SON (1920) LTD., P. SIMONS, J. SMELLIE, STARK & SON, LTD., SUTTON & SONS, LTD., W. J. UNWIN, LTD., and not forgetting our overseas friends Messrs. JAMES BLAND, W. ATLEE BURPEE & CO. and FERRY-MORSE SEED CO.

Unfortunately I believe there are many who are frightened to grow Sweet Peas on the grounds that a very elaborate preparation

and a great deal of hard work is required. But this is not true unless one aspires to becoming one of the leading exhibitors. Despite the foregoing it should be the aim of all to produce good blooms, and I will attempt briefly to outline some of the salient points.

It has been estimated that about three-quarters of the growers in this country sow their seed in the spring. This strikes one as strange for without a shadow of doubt autumn-grown plants give far better results, in fact they flower earlier and often continue longer, the plants are more vigorous, the blooms are larger and the colours more brilliant.

The plants, which should be raised in pots or boxes and placed in a cold frame or greenhouse, are hardy, only requiring protection from excessive rain and frost. When frozen, they will come to no harm if thawed slowly and covered against strong sunshine.

Success largely depends on a suitable preparation of the soil. If grown in rows, these should run north and south, while protection from the north and east winds is useful. As Peas like a firm root run it is advantageous to complete the preparation by Christmas. Narrow trenches will produce poor results, thus it is best to trench the whole plot to a depth of, say, 2 to 2½ feet, assuming of course that the area is well drained. The reason for this is that Sweet Peas prefer a good lateral root growth. With the exception of the top 8 inches, which should be left rough, a good dressing of old farmyard manure, bonemeal and wood ash should be thoroughly incorporated in the soil. Manure should never be left solid in the soil. A good dressing of lime, if required, should be given.

Planting out should be done as early in March as the weather will permit. But a month prior to this a top dressing of a well-known fertilizer should be made and a good tilth obtained. Most fertilizers are deficient in potash content for the needs of Sweet Peas, and the addition of 1 lb. of sulphate of potash to every 4 lbs. of fertilizer may be found beneficial.

It is necessary to tie the plants the day they are planted, for much damage can be done if they are left to the mercy of the wind. The best supports to use are 7-foot bamboos or bean poles, which should be securely fixed, for the foliage of well grown peas provide a great screen which can be easily blown down in a strong wind. The distance apart when planting out is a matter of opinion, but I would suggest 12 to 18 inches between double rows and 6 to 9 inches between plants. After the plants have been in the ground for about three weeks, the basal shoots should be restricted to one growth or in the case of very robust plants to two growths.

As the warmer weather approaches, growth will become rapid and regular tying will become necessary. No lateral growth should be allowed to divert the energy of the main growth and should be removed when large enough to handle.

To produce good-sized blooms on long stems one should aim at building up a robust plant with large healthy leaves, and the basis for this is a careful preparation of the soil. No amount of top feeding during the growing season will convert weakly plants into strong ones. Feeding, if necessary, is a great art. A specially prepared Sweet Pea fertilizer may be used, but the directions should be very accurately followed, giving under-doses rather than over-doses. As Sweet Peas thrive in a warm humid atmosphere, it is a good plan to spray the foliage with soft water, using a fine nozzle, during the

evenings in hot weather. Mulching is not necessary except on particularly well drained soils.

From the above one will gather that I advocate the "cordon" system for growing good quality flowers. It is rather interesting to know that this method resulted from an accident. The late Mr. TOM JONES, a very successful exhibitor from Ruabon, walking round his plants after a heavy storm, found several side growths broken down. He tied up the centre growths and cut away the broken side growths. As a result, he found the flowers developed splendidly both in length of stem and size of bloom.

What does the future hold for the Sweet Pea? Visitors to the National Sweet Pea Society's shows just before the war might ask how these exhibits could be improved? Undoubtedly there is still scope for the clever hybridist.

We have orange-scarlets being "held" against the sun, but we still await the pure orange which will not scorch without shading and as mentioned above, hybridists are still searching for a true gentian blue and buttercup yellow.

We may see further headway with the American Ruffle type—these are very wavy and inclined to give a high percentage of duplex blooms. But on the other hand, their placement is poor for they are inclined to bunch the blooms on top of the stem, they lack vigour and length of stem.

The Sextet strain has given us ease in producing six or seven bloomed sprays, but here again there are faults, for the blooms are too small and it is difficult for the top bloom to open before the bottom bloom has faded. The writer would like to see a variety consistently producing five good sized blooms.

With the introduction of 'Gigantic' and 'Leader' before the war, we saw an increase in size, which no doubt will be followed up in post-war years. Surely the one thing which is not required is greater length of stem, for when one sees stems exceeding 18 inches they appear to be out of proportion to the present size of bloom.

Some people claim there is a lack of fragrance about the modern Sweet Pea, a contention with which none of the leading growers will agree. To retain this delicate fragrance is essential but to increase it would hardly be desirable.

Much has been written and said about varieties being far too numerous. The war-time restrictions on flower seed production will undoubtedly curtail the lists of varieties offered after the war, resulting in a survival of the best.

Without a doubt, when peace is with us once more, there will be a tremendous revival to flower growing. The Committee of the National Sweet Pea Society in resuming the Society's activities in 1944, were fully alive to the opportunities.

I would like to thank Messrs. ROBERT BOLTON & SON for the photograph of 'Mrs. C. Kay' (Fig. 43) and Messrs. W. J. UNWIN, Ltd., for the photograph of the oldest specimen of a Sweet Pea in existence (Fig. 44).

THE MAKING OF LANARTH.

By THE RT. REV. J. W. HUNKIN, Bishop of Truro.

(Continued from p. 110.)

MAGNOLIAS now in the garden include, beside those already mentioned in these notes, *M. conspicua*, *mollicomata*, *robusta*, *salicifolia*. *Berberis Knightii* is now immense. Near *Tetracentron sinensis*, with its fine red stems, Mr. WILLIAMS planted several *Cercidiphyllum japonicum*. It had been said that these two plants are easily confused. Mr. WILLIAMS planted them together to show how distinct they are. *Deutzia Wilsoni* is large and very pretty. *Stuartia sinensis* is now a fine tree flowering on top, so that the flowers are difficult to see. *Rhodoleia Championi*, the first to flower in England, is still flourishing, but so far has rather disappointed expectation.

In autumn 1931 Mr. WILLIAMS planted a 'Comber' Guevina from LIONEL DE ROTHSCHILD, a *Parasyringa* from DALRYMPLE, and a few *Pernettyas* by the Heaths at the top of the slope, including a male from Knaphill. 'Garden boy,' he adds, "after Brambles which are on the increase." He continues: "Have done usual amount of cleaning and dressing shrubs, also more cutting out, which becomes increasingly necessary."

In 1932 things were early. *Hamamelis arborea* and *Camellia speciosa* are noted as being good; and the pale pink *Rhododendron* by the Myrtles "really fine." Later on the *Embothriums* flowered well although their leaves had been badly stripped during the winter. By this time the season had lost pace and become late. Mr. WILLIAMS speaks well of his *R. campanulatum* × *Fortunei*. "This came from seed of the best Tregrehan *campanulatum* and was 'bee-crossed' by *Fortunei*. I raised many plants but only this one showed the cross."

In October the rare and strongly aromatic *Magnolia cordata* came from MARCHANT, *Azalea Trebotan* from Caerhays, and *Rhododendron* 'May-Day' from Werrington Park.

The summer of 1933 was very dry. Several specimen plants died, "probably from honey fungus." In December snow lay about for ten days. The spring of the following year was unusually late. Mr. WILLIAMS cut down a *Paulownia* which was taking up too much space. The writing in the Garden Notes now shows that Mr. WILLIAMS' sight was going. He made light of the privation. In 1943 *Azara lanceolata* was planted by the Myrtles. At Christmas *Rhododendron venustum* (a cross from *nobleanum*) was at its best, *Hamamelis mollis* was very good and *R. Ririei* was opening.

The spring of 1935 started very early, but was slow moving. A golden Alder from Windsor Park, a *Syringa species* from WORMALD, and a *Sorbus Wilsoni* were planted out. There is an interesting note dated April 21:

"H.R.H. the Prince of Wales rang up on the evening of 20th April, asking if he might come with some friends to see the garden next day. He arrived about 2.30 and stayed until 4 P.M., when he went on to Trebah for tea by arrangement. Capt. and Mrs. Hunter and Capt. and Mrs. Simpson were of the party. We had had a lot of rain and things were not at their best. *Camellia reticulata*, *R. Edmondi*, *Cornus Nuttallii* and Kurume Azaleas were the best things in the

garden. H.R.H. took considerable interest in the plants he was growing but not much in others. I gave him two 'Monmouth' bill hooks which he took away in the car."

The last note on plants in Mr. WILLIAMS' own handwriting refers to the flowering of "home crosses" of Rhododendrons: *Ririei* × *niveum*, early purple; *Britannia* × *Kingianum* (= 'Loyalty'), a large red truss; *Britannia* × *campylocarpum*, a very nice pink, small but nice truss; a *Fortunei* ×, a nice dwarf red. Mr. WILLIAMS adds "The *orbiculare* × *Fortunei* are very nice." This is Mr. WILLIAMS' hybrid registered as Fortorb. Another Rhododendron in the 1939 edition of the Year Book of the Rhododendron Association is put down to him: 'St. Keverne' (already mentioned—*Kingianum* × *Griffithianum*, 1922). Yet another is recorded under the date 1940: 'Garnet' (*Griffithianum* × *Broughtonii*). The last words of Mr. WILLIAMS' note are "I crossed *niveum*, *decorum*, 'Athlone' and an *Azalea* with *Griersonianum*." Mr. WILLIAMS died on November 6, 1935.

All this work in the Lanarth Garden, thus briefly indicated in these pages, represents but a small part of Mr. WILLIAMS' activities. For forty years he had been a most successful raiser of Daffodils, his first cross having been made in 1895. For some account of his achievements reference may be made to the *Daffodil Year Book*. Particularly notable are a paper of his entitled "Some of my Favourite Daffodils" (*Daffodil Year Book*, 1914), and a lecture which Lord ABERCONWAY described as a "thrilling lecture," delivered on April 16, 1935, on "British Daffodils, Past and Present." Mr. WILLIAMS also contributed seven short papers (of great distinction) to the Rhododendron Society Notes. They are as follows:

I. (1916-1919). Pp. 39, 40 and 239, 240, *Notes on Chinese Rhododendrons as grown in Cornwall*. Here Mr. WILLIAMS observes that large-leaved Rhododendrons to be their best ought to have absolute shelter from wind. Pp. 122-130, *American Azaleas and their Hybrids*, with J. G. MILLAIS, January, 1917.

II. Pp. 89, 90, *Conversion of Woodland into Shrubbery*, December, 1921. As wind-breaks on the outside margins Mr. WILLIAMS recommends: Laurels, Hollies (especially *I. Aq.* var. *camelliaefolia*) and *Rhododendrons ponticum* and *caucasicum*. Among other shelter plants he mentions *Drimys Winteri* and *aromatica*, *Griselinia littoralis* of a very refreshing green (the plants at Lanarth are very large), *Myrtus luma* (*Eugenia apiculata*), Common Bay (best form *canariensis* with broad leaf), *Tricuspidaria lanceolata*, *Viburnum coriaceum*, *Escalonia* (*macrantha* is probably the best), *Olearias*, *Arundaria fastuosa* (twenty feet), *A. anceps*, a great trespasser, *Pittosporums* (extraordinarily tall at Lanarth), liable to wind-shake. Mr. WILLIAMS notes that *Choisya ternata* and *Thujopsis dolabrata* will grow under Beech trees. Pp. 141, 142, *Notes on Chinese Rhododendrons*, December, 1922. Mr. WILLIAMS records his impressions of plants growing at Lanarth. *R. discolor* was remarkably fine in many gardens in 1922—covered with magnificent flowers. *R. repens* is difficult but a gem; it trails like Ivy and produces bells of blood-red. *R. cephalanthum* is rather slow. Pp. 274, 275, *The Knapp Hill Azaleas*, December, 1942. ANTHONY WATERER died in July, 1924.

III. Pp. 139, 140, *Bosahan*, 1926. P. 204, *Scorrier*, 1927.

Brief but brilliant descriptions of two notable Cornish gardens. To these must be added the obituary notice of J. G. MILLAIS, p. 327, 1931.

I have noted two references to Mr. WILLIAMS in the *Botanical Magazine*. In Vol. 151 (1925), under 9096, *Cordyline indivisa*, he is quoted as saying that in Cornwall this plant suffers more from excessive wet than 10° F. of frost, and the figure of *Abies Forrestii* was prepared from materials sent from Lanarth (t. 9201, Vol. 153, 1927).

In addition to all his garden activities Mr. WILLIAMS was assiduous in his work for the Cornwall County Council, and served on a number of committees. It became quite a custom for the two cousins, J. C. and P. D., to have lunch together after the meetings in the County Hall in the Education Secretary's room; and with them generally was their younger friend Mr. G. H. JOHNSTONE. On these occasions Mr. J. C. WILLIAMS would produce three apples all done up in paper and each had to take his chance (all the chances were good). Mr. WILLIAMS was Chairman of the Selection Committee of the County Council, and for many years Chairman of the Horticultural Sub-Committee. It was during his period of office that some of the greatest strides were made in the development of Cornish commercial horticulture. The Roscoff Broccoli, for instance, was introduced, and bulb sterilisers were made available for growers in the county. Mr. WILLIAMS in his early days was a good shot and used to hunt with the Four Barrow Hounds. For a number of years he was People's Warden of St. Keverne Parish Church, and he is remembered in the parish with respect and affection. In a garden he was ever a sparkling companion, a fine judge of a plant, with a wonderful hand and touch for a flower. He was one of the outstanding personalities of the R.H.S.

"Instead of thy fathers thou shalt have children," said the Psalmist (Ps. 45, 17), and now there reigns at Lanarth Mr. MICHAEL WILLIAMS, Mr. P. D.'s only son, whose head gardener is Mr. GREET, son of Mr. FREDERICK GREET. The garden is somewhat afflicted with Brambles and other war-time nuisances, but it still holds its place as one of the two or three most outstanding gardens in the county.

An interesting description of the garden in 1939 was given by Mr. R. HAY in the *Gardener's Chronicle* (July 15). Since then I have visited it several times and through Mr. MICHAEL WILLIAMS' great kindness I am gradually getting to know it. On a wet Sunday last November (November 5, 1944), in the intervals between church services, I was taken round the garden in the rain. Then, or on some previous occasion, I have seen many of the plants referred to in these pages. Among others not hitherto mentioned I remember a *Telopea truncata* just beginning to flower in the middle of May (1941), an enormous *Davidia involucrata*, an interesting *Azaleadendron*, *Enkianthus*, beloved of queen wasps, *Osmanthus Forrestii*, a big bush now given more head room, a particularly fine form of *Cornus florida rubra*, *Ternstroemia japonica* which colours well in autumn, LIONEL DE ROTHSCHILD'S very best blue *R. Augustinii*, a *Pernettya* with the largest pink berries I have ever seen on such a plant, the Banana which has fruited almost every year of Mr. MICHAEL WILLIAMS' life, a great *Camellia cuspidata*, *Emmenopterys Henryi*, now a good-sized tree which is some day expected to produce a notable flower, and *Ribes longiracemosus*—and the racemes (on a previous occasion) were long indeed.

My last visit was on the first Sunday of this year (1945), when I went round rapidly with Mr. MICHAEL WILLIAMS to fill in some of the gaps in my knowledge of the garden. Among other things I noted the *Juniperus Coxii* by the *Hamamelis mollis* (then in its most splendid condition), a big *Metrosideros lucida* in rude health, a big *Camellia*

cuspidata, a *Manglietia Hookeri* 30 feet high, a fine rounded plant of *R. Williamsianum*, good specimens of *R. Kingianum*, *R. argenteum*, *R. Loderi*, and a tall *Michelia Doltsopa* pushed into a slant by neighbouring trees and soon to be relieved. I noted how the rabbits had eaten freely of the bark of the low-growing *Magnolia Watsoni*. I admired the great *Lindera macrophylla*, with fine long leaves, a lovely snake-barked *Acer*, an *Acer griseum* which seeds, a cut-leaf Beech, a *Pittosporum* with a very large bright green leaf, and the lovely bark of *Stuartia sinensis*.

To study the garden and the Garden Notes of a glorious garden like Lanarth is the greatest possible refreshment in war-time, and fills many a hole in a scanty horticultural education. I am most grateful to Mr. MICHAEL WILLIAMS for the privilege he has given me and for his skilled and generous assistance on all occasions.

THE PRODUCTION OF ONION SETS.

By M. A. H. TINCKER and F. C. BROWN, Wisley, and O. V. S. HEATH and M. HOLDSWORTH, Research Institute of Plant Physiology, Imperial College of Science and Technology.

IN this JOURNAL (Vol. 69, p. 66) an account was published last year of recent investigations concerned with the production of Onions from sets. The present article deals especially with the production of the sets from seed. It is based upon the results, so far analysed, of experiments designed to fulfil statistical requirements and conducted at Wisley, Rothamsted and Woburn.

Sowing Dates.—All seed was treated with Calomel * before sowing. In 1942, at Wisley, seven varieties, namely, 'Bedfordshire Champion,' 'James Keeping' (modern type), 'Giant Zittau,' 'Ebenezer,' 'Brown Globe,' 'Danvers Yellow Globe' and 'Red Wethersfield,' were sown on three occasions, May 12, May 22, and June 3. The soil conditions of tilth and moisture were highly satisfactory and a good establishment of seedlings ensued. The English varieties, 'Bedfordshire Champion,' 'James Keeping' and 'Giant Zittau,' gave inferior yields of sets to the four American kinds from all three sowings. The best crop of useful sets was obtained from the variety 'Ebenezer' sown May 12; from the later sowings smaller yields resulted.

Seed Bed.—Success depends upon maintaining an adequate supply of water in the surface soil until establishment is complete. At Wisley this requirement was met without additional watering after sowing; at Rothamsted, though on a heavier soil, watering during the whole period of germination gave consistently successful results in the five seasons 1940-44; a similar use of water on sandy soil at Woburn in 1944 also gave the best results. Besides adequate water supply, consolidation of the soil and a fine tilth are in our experience necessary. Phosphate manuring is generally recommended though it has not been found essential.

Rate of Sowing.—The seed samples used fulfilled the requirements of the Seed Act, 1920, in regard to germination. The tests at Wisley, Rothamsted and Woburn, to determine the best rate of sowing, have

* Ministry of Agriculture Advisory Leaflet, No. 163.

given good agreement, indicating a rate of $\frac{1}{4}$ to $\frac{1}{2}$ oz. of seed per square yard. The following data taken from a 1944 experiment at Wisley illustrate this point with the variety 'Ebenezer'.

YIELDS IN POUNDS PER SQUARE YARD.

Seed rate in oz. per sq. yd.	Size grade of sets (diameter).			Total useful sets $\frac{1}{4}$ "- $\frac{1}{2}$ ".
	$\frac{1}{4}$ "- $\frac{1}{2}$ " (approx. 600 to 1 lb.)	$\frac{1}{2}$ "- $\frac{3}{4}$ " (approx. 200 to 1 lb.)	More than $\frac{3}{4}$ "	
$\frac{1}{4}$	1.35	2.28	1.57	3.63
$\frac{1}{2}$	3.48	2.26	0.84	5.74
1	4.85	1.35	0.45	6.20

The figures show that an increase in the seed rate from $\frac{1}{4}$ to $\frac{1}{2}$ oz. per sq. yard materially increased the yield of small sets, and decreased the yields of bulbs of more than $\frac{3}{4}$ -inch diameter. The yield of useful sets was increased substantially but not doubled; a further doubling of the seed rate, whilst increasing the yield of small sets, decreased that of the medium-sized sets, $\frac{1}{2}$ "- $\frac{3}{4}$ " inch, and the total yield of useful sets was not greatly, nor economically, increased. Woburn results were rather more favourable to the $\frac{1}{4}$ -ounce seed rate.

Methods of Sowing—Technique. (a) Depth.—The depth of sowing in all our tests was $\frac{1}{2}$ inch and this has proved highly satisfactory. The rate of sowing, at $\frac{1}{2}$ oz. per square yard., approximates to three seeds per square inch. Care is needed if the seed be broadcast to ensure even sowing and in practice it has been found that the use of a draw rake with 9 teeth spaced at 1 inch to mark out 9 rows, results in more even sowing. If plots of three feet wide be used, four widths can be quickly marked.

(b) Shape of Plot.—The yields per square yard from plots $1\frac{1}{2}$ feet or 3 feet wide were closely similar to those from very narrow strips, except that in the latter the edge effect resulted in the rejection of a higher proportion of the bulbs as too large. A square plot reduces to a minimum this 'edge' effect, but wide plots are not recommended as they impair the efficiency of weeding; a yard's width has proved convenient to the workers.

Weed Control.—The sites selected for set production should be known to be reasonably free from weed seeds. Careful weeding in the earlier phases of growth is a necessity and this operation was estimated at Wisley to take 1 hour per 6 square yards on ground selected with a low weed content. At Woburn, on relatively light soil heavily infested with annual weeds, sulphuric acid spraying was resorted to. The acid was applied on June 15, when the seedlings possessed two leaves, at a rather later stage of development than is usually recommended. The first seedling leaves of the Onions were killed or severely damaged but the plants made a good recovery. The acid treatment was completely effective in controlling the annual weeds, though it would not kill the underground stems of twitch (couch) or certain thistles. Details of such spraying are available in Ministry of Agriculture Advisory Leaflet 309.

Other Points of Technique.—Competition between seedlings. Tests at Woburn have revealed that with $\frac{1}{4}$ oz. or $\frac{1}{2}$ oz. of seed per square yard,

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

NOVEMBER 7, 1944.

FRUIT AND VEGETABLE COMMITTEE.—Dr. R. S. HATTON, F.R.S., V.M.H., in the Chair, and nine other members present.

Exhibits.

Apple 'Fletcher's Prolific,' from the Director, East Malling Research Station, East Malling, Kent.

Apple 'Margaret Taylor,' from Mr. F. E. Taylor, Hollydene, Wheeler Lane, Witley, Surrey.

Apple 'Pamela Hollinshead,' from Mrs. Hollinshead, Firbank, Bickley Road, Bickley, Kent.

Apple 'Phayre Seedling,' from Col. R. B. Phayre, M.C., Collatons House, Bow, Devon.

Apple 'Sunset,' from Mr. W. Rogers, The Court Lodge, Horton Kirby, Dartford, Kent.

Seedling Apple, from R. E. Brain, Esq., 9 Belle Vue Avenue, Roundhay, Leeds.

Seedling Apple, from Mrs. Forwood, West Chart, Limpsfield, Surrey.

Seedling Apple, from W. G. Grainger, Esq., 3 Wistow Road, Selby, Yorks.

Seedling Apple, from G. Haywood, Esq., The Lodge, Huncote, Leicester.

Seedling Apple, from Miss M. E. A. May, Stubbington, Fareham, Hants.

Seedling Apple, from Thomas Miller, Esq., Church Road, Bebington, Wirral, Cheshire.

Seedling Apple, from Mrs. Rendle, Little Reeves, Amersham Common, Bucks.

Seedling Apple, from A. E. Sadler, Esq., Montford, 22 Queens Road, Woodford Green, Essex.

Seedling Apple, from R. O. C. Storey, Esq., 32 Halsbury Road East, Northolt Park, Middlesex.

DECEMBER 5, 1944.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.H.M., in the Chair, and ten other members present.

Awards Recommended :—

Award of Merit.

To *Cyripedium* × 'Silver Wings' ('Vestalia' × 'F. C. Puddle') (votes 7 for, 1 against), from Lord Aberconway, Bodnant, Tal-y-Cafn, Denbighshire. See p. 151.

To *Cyripedium* × 'Vista' var. 'Excelsior' (Cardinal Mercier' × 'Openshaw'), (votes 8 for, 0 against), from Messrs. Sanders, St. Albans. See p. 151.

To *Cyripedium* × 'Battle of Egypt' var. 'Alpha' (Red Start' × 'Miracle') (votes 8 for, 0 against), from Messrs. Sanders, St. Albans. See p. 151.

To *Cyripedium* × 'Judith Dance' (*Hassallii* × 'Hestia') (votes 8 for, 0 against), from Mr. D. A. Cowan, 118 Hook Rise, Surbiton. See p. 151.

FRUIT AND VEGETABLE COMMITTEE.—Mr. A. CHEAL in the Chair, and nine other members present.

Exhibits.

Apple 'Easter Morn,' from T. Alexander, Esq., 22 Curzon Road, Parkstone, Dorset.

Seedling Apple, from Mr. W. Westerman, West View Nursery, Pleasant Valley, Saffron Walden.

Seedling Apple, from R. O. C. Storey, Esq., 32 Halsburg Road East, Northolt Park, Middlesex.

Seedling Apple, from F. T. Pywell, Esq., Broomfield, Hollyfield Road, Sutton Coldfield.

Seedling Apple, from Mrs. A. E. Turner, 60 Valleyfield Road, Streatham, S.W. 17.

Melon 'December Gold,' from J. W. Read, Esq., Karemunga, Hockley, Essex.

JANUARY 9, 1945.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and 12 other members present.

Awards Recommended :—

First-class Certificate.

To *Odontoglossum* × 'Goldbeam' var. 'Luna' ('Rêve d'Or' × 'Goldstar') (votes 7 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 151.

Award of Merit.

To *Cypripedium* × 'Cradillon' var. 'Miona' ('Cramore' × 'Lady Dillon') (votes 6 for, 1 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 151.

To *Cymbidium* × 'Jean Brummitt' (*Devonianum* × *eburneum*) (votes 8 for, 0 against), from Messrs. Sanders, St. Albans. See p. 151.

FEBRUARY 20, 1945.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRETT, V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended :—

Silver Knightian Medal.

To Messrs. Sutton and Sons, Reading, for group of vegetables.

Recommended for trial at Wisley.

Apple Seedling from A. C. Nash, Esq., Scutes Farm, Elphinstone Road, Hastings.

Apple 'Corry's Wonder,' from J. F. Wastie, Esq., Eynsham, Oxford.

Other Exhibits.

Collection of vegetables from Messrs. Allwood Bros., Haywards Heath.

Apple 'Onslow,' from W. Cleveland, Esq., 9 Onslow Road, W. Croydon, Surrey.

Apple Seedling from D. Gutteridge, Esq., York Cottage, Henham, Bishop's Stortford.

Apple Seedling from G. Munday, Esq., Ridge Way, Dudsbury Hill, nr. Wimborne, Dorset.

Apple Seedling from Mr. J. Power, The Seed Shop, Pokesdown Station, Bournemouth.

Apples 'Wolf River' and two seedlings, from Mr. R. Staward, The Gardens, Ware Park, Ware, Herts.

Apple 'Admiral,' from Mr. A. K. Watson, Dyke End, Upton, Norwich.

Apple 'Oxford Hoard,' from J. F. Wastie, Esq., Eynsham, Oxford.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. W. A. Constable & Co., Tunbridge Wells, for an exhibit of *Lachenalia*.

Silver Banksian Medal.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations and *Streptzia Reginae*.

Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations.

Other Exhibits.

Primula malacoides 'Bonvilston Seedling,' from Mrs. R. H. Williams, Bonvilston House, nr. Cardiff.

Primula malacoides 'Red Delight,' from Studley College, Warwickshire.

Primula malacoides 'Wicks' Crimson,' from Mr. W. C. Wicks, Mapperley, Nottingham.

Primula sinensis immaculata, from J. M. Cohen, Esq., Hammers Lane, Mill Hill.



Photo, Maby & Co.]

FIG. 43 —SWEET PEA ' MRS. C. KAY ' SHOWING MODERN TYPE
(See p. 131)



FIG. 44.—THE OLDEST SPECIMEN OF A
SWEET PEA IN EXISTENCE.

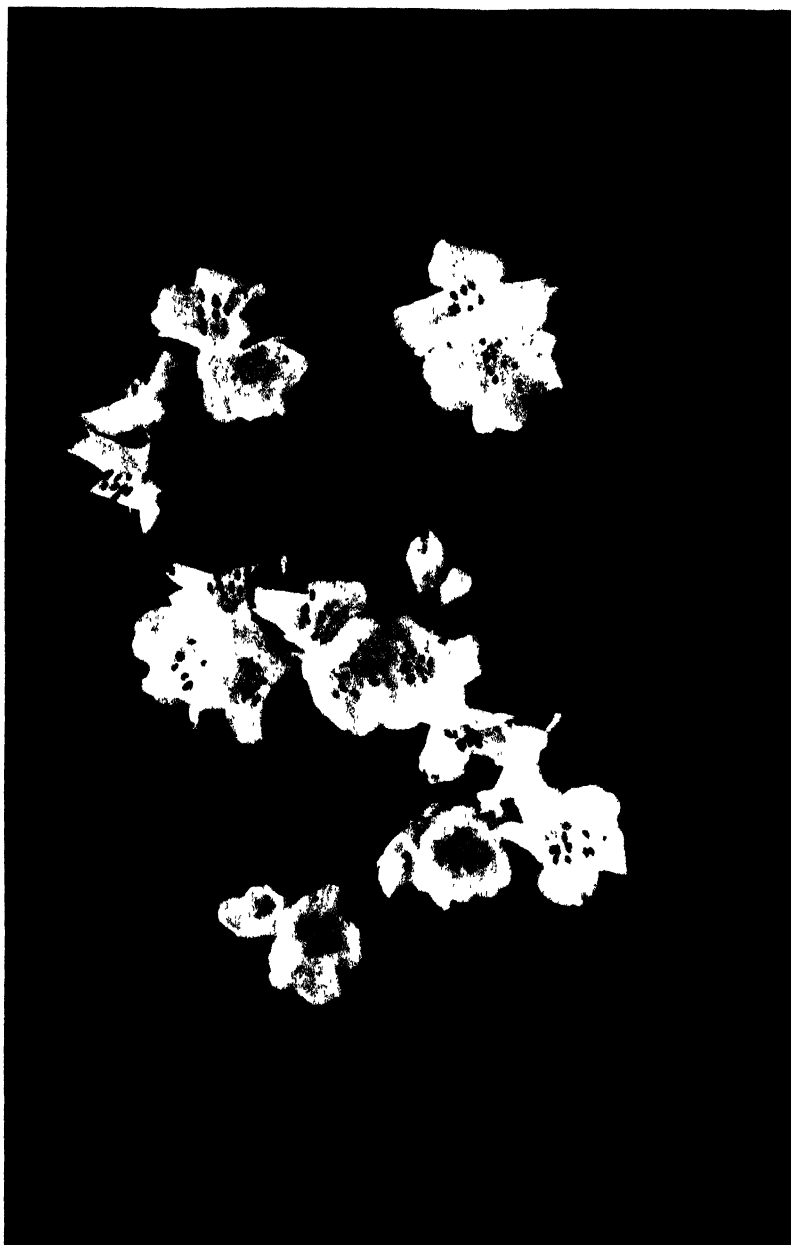
An illustration of dried and pressed
Sweet Pea flowers and foliage from
Plukenet's Herbarium (date about
1700)

(See p 131)



FIG. 45 —LATHYRUS ODORATUS FROM THE
BOTANICAL MAGAZINE, 1788 (REDUCED).

(See p. 128.)



Photo, Abbing]

FIG. 46. -- RHODODENDRON 'BRIC-A-BRAC.'



FIG. 47.—ONION SETS. GLASS COVERS TESTED FOR SET PRODUCTION
(See p. 137)

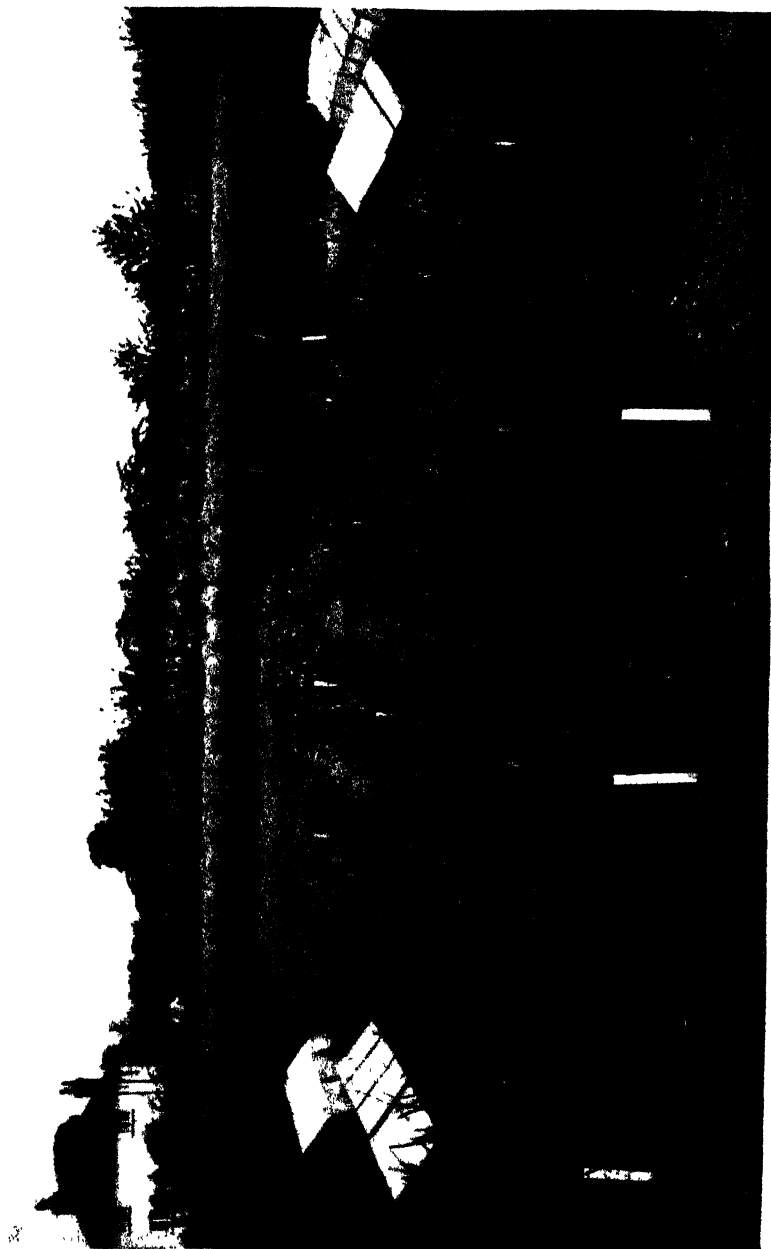


FIG. 48.—ONION SETS : A SERIES OF PLOTS TO TEST THE INFLUENCE OF NITROGENOUS FERTILISERS.
(See p 137)

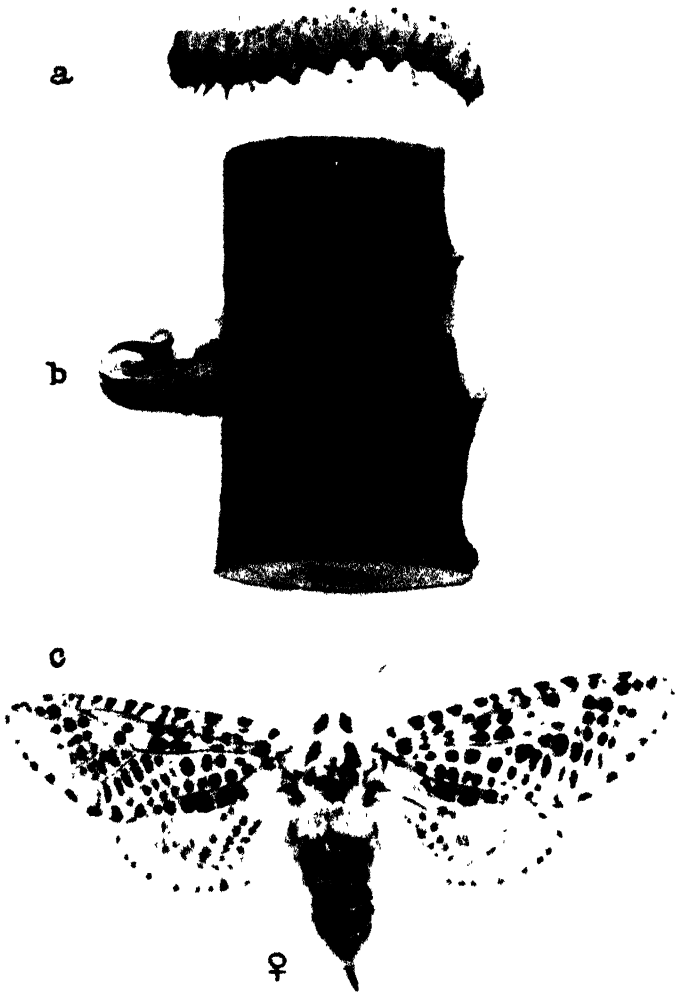


FIG 49—LEOPARD MOTH, *ZEUZERA PYRINA*, SHOWING (a) FULL-GROWN CATERPILLAR, (b) PUPA-CASE, AND (c) FEMALE MOTH.

(See p. 149.)

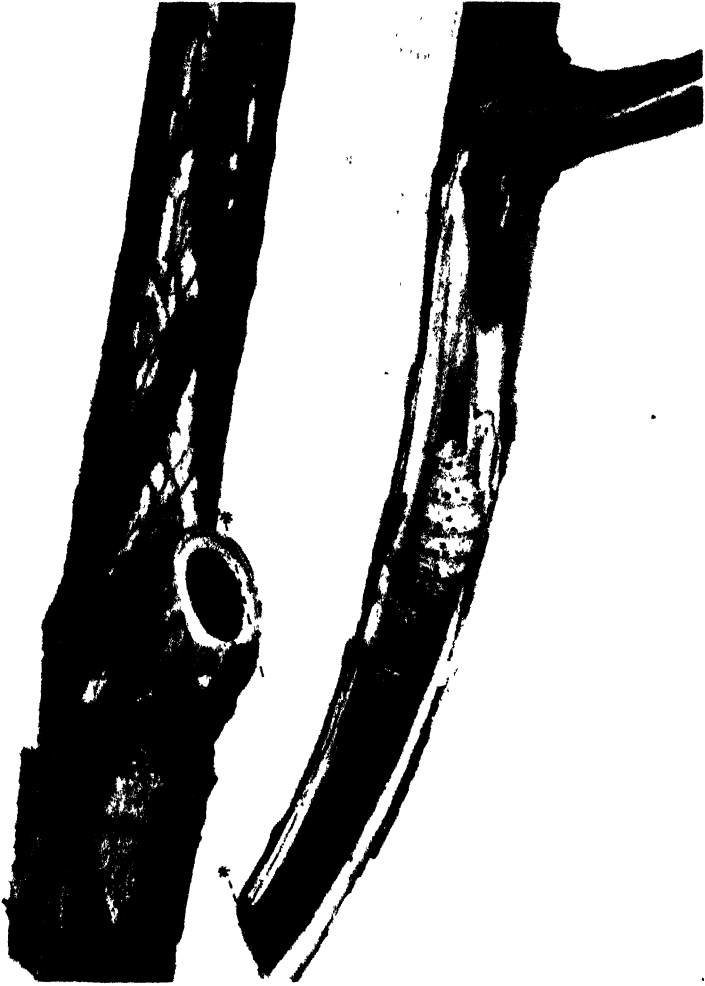


FIG. 50 — LEOPARD MOTH CATERPILLAR TUNNELLING IN BRANCH OF RHODODENDRON PONTICUM.

(See p. 149.)



Photo, N. K. Gould.]

FIG 51 — TULIPA CELSIANA AT WISLEY

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—

Flora Medal.

To Messrs. J. Cheal & Sons, Crawley, for an exhibit of flowering and evergreen shrubs.

To Mr. E. Ladhams, Elstead, for an exhibit of flowering shrubs and rock garden plants.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering and evergreen shrubs.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering and evergreen shrubs.

Other Exhibits.

Arundinaria fastuosa (to show ornamental colouring of cane), *Athrotaxis cupressoides*, *Dacrydium cupressinum*, exhibited by Commander F. Gilliland, R.N.V.R., Brook Hall, Londonderry.

Buddleia asiatica, *B. madagascariensis*, exhibited by the Director, R.H.S. Gardens, Wisley.

? *Hesperanthe angusta*, exhibited by Colonel F. C. Stern, O.B.E., M.C., Highdown, Goring-by-Sea.

Lonicera × *Purpusii*, exhibited by W. Bentley, Esq., Quarry Wood, Newbury.

DONATIONS TO THE SOCIETY'S GARDENS AT WISLEY, 1944.

ADAMS-ACTON, MURRAY, Kensington; seeds of Rhododendrons. ADDIS, Captain G. T., Woking, Surrey; grafting wood of Plum. ALLCARD, Mrs., Cobham, Surrey; *Citrus decumana*. AMSLER, Dr. M., Hawkhurst, Kent; plants. ANDERSON, E. B., Buckingham; seeds. ATKINSON, Miss, St. Davids, Pembrokeshire; seedlings. BAKER, G. P., Sevenoaks, Kent; Irises. BARCROFT, N., Newry, Co. Down; Liliium bulbs. BARR, W. R., Covent Garden, W.C. 2; Crocus corms. BOWLES, E. A., Enfield; seeds of *Narcissus viridiflorus*. BRAYBON, A., Kensington; seeds. BROWN, —, Coldingham; seeds of Primulas. BROWN, J. J., Westcliff-on-Sea; seeds. BROWN, T., Cardross, Dumbartonshire; grafting wood and seedlings. BURKWOOD AND SKIPWITH, LTD., Kingston; *Leptospermum scoparium prostrata*. CHITTENDEN, F. J., Dedham, Essex; seeds. CLARKE, Lt.-Col. R. STEPHENSON, Haywards Heath, Sussex; *Scutellaria incana*. COOKE, R. B., Corbridge, Northumberland; seeds. COPELAND, T., Wokingham, Berks.; seeds. CORBIN, R. J., Seychelles Islands; Coco-der-Mer—*Lodoicea seychellorum*. CRANFIELD, W. B., Enfield Chase; *Rhododendron prostratum*. CREWDSON, B., Limsfield, Surrey; grafting wood of Apples. DENNY, Mrs. LUCIE, Cheltenham; seeds. DICKSON, H. T., Polegate, Sussex; plants. DOE, R., Reading, Berks.; grafts of seedling Apple. EAST MALLING RESEARCH STATION, East Malling, Kent; Strawberry plants. EDGE, Mrs. W., Nyasaland, C. Africa; seeds from Nyasaland. EDINBURGH ROYAL BOTANIC GARDEN, Edinburgh; seeds and plants. ENEMY PROPERTY, CUSTODIAN OF; seeds. FENWICK, MARK, Stow-on-the-Wold, Glos.; plants and seeds. FIELD, Mrs., East Grinstead; R.H.S. Journals for 1943. GLENDENNING, R., British Columbia; seeds. GODFREY, W. H., Kingston-on-Thames; seedlings. GODMAN, the late DAME ALICE, Horsham, Sussex; bulbs. GOODWIN, A. R., Kidderminster; plants. GRAHAM, F. J., Paignton; seeds. GRANTHAM, Mrs. M., Lewes, Sussex; grafting wood of Apple 'Sussex Peach.' GUNSON, R. W., Ltd., E.C. 3; seeds from Argentine. HAINES, H. H., Berriew, Mont.; plants of Wild Garlic. HARLEY, A., Blinkbonny, Kirkcaldy; seeds. HARRISON, A. T., Glasgow; seeds of Liliium. HIGGINS, Mrs. V., R.H.S., Westminster; seeds. HILLINGS AND CO., Chobham, Surrey; plants. HINKS, A. R., Royston, Herts.; plants. HODGKINS, L. H., Reading; grafting wood of Apple. HOLB, Miss D., Reading, Berks.; *Calceolaria polyrrhiza*. HORTON, E. B., Bath; collection of bulbs, corms, etc., from N. Africa. HOWLETT, C. J., Reading, Berks.; grafting wood and plants. HUDSON, E. E., Liverpool; seeds. IBBOTSON, A., Barnsley; plants. INGALL, W., Louth; Tree Greengage 'Ingall's Grimoldsby.' INGWERSEN, W. E. Th., East Grinstead, Sussex; Clerodendron. JACKMAN, GEORGE AND CO., LTD., Woking; plants. JOHN INNES HORTICULTURAL INSTITUTION, Merton, S.W. 19; seeds and plants. JOHNSON, A. T., Conway, N. Wales; seeds and plants. JONES,

xxviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

G. H., Leighton Buzzard ; plants. KAYE, W., Guildford ; plants and seeds. KENCH, A., B.N.A.F. ; bulbs from N. Africa. KNAPHILL NURSERIES, LTD., Woking ; *Rhododendrom quinquefolium*. LADHAMS, E., Godalming, Surrey ; plants. LAMB, G., Swanley, Kent ; grafting wood of Apple sport from 'Barnack Beauty.' LASCELLES, Captain H. P., Prestbury, Glos. ; plants and seeds. LAWRENCE, IRIS Lady, Godalming, Surrey ; plants. LEE, Mrs. E., Chislehurst, Kent ; seeds from Burma. LINDSAY, Miss N., Sutton Courtnay, Berks. ; *Rosa Romola*. LOCKWOOD, Mrs. BIRSTALL, Leeds ; seeds of Delphinium. MANSFIELD, T. C., Orchard Neville, Som. ; seedlings. MARCHANT, W. J., Wimborne ; plants. MARTINEAU, Lady ALICE, Sunningdale ; plants. MAYDON, D. I., Gillingham, Dorset ; *Oxyptalum coeruleum*. McCULLOCH, Mrs., Castle Douglas ; seeds. McLEAN, Rev. W. J. H., Darlington ; cuttings. MEYER, The Rev. Canon Rollo, Little Gaddesden, Herts. ; corms. MILLARD, W. S., Tunbridge Wells ; seeds. MILNER, Executors of the late Mrs. W. A., Sheffield ; *Nerine Bowdenii*. MULLIGAN, B. O., Send, Surrey ; seeds and plants. MUSGRAVE, C. T., Godalming, Surrey ; bulbs. NEEDHAM, C. L., Masterton, New Zealand ; seeds. OLDHAM, W. R., Newport, Isle of Wight ; plants. PALMER, Sgt. J. L., Ripley, Surrey ; seeds. PALMER, THE HON. LEWIS, Winchester ; seeds. PAYNE, A. H., Crowfield, Suffolk ; grafting wood of Apple 'Hollow Crown Pippin.' PAYNTER, Mrs. S., Redhill, Surrey ; seeds. PAYNTER, W., Redhill, Surrey ; seeds. PETTIT, H. E., Egham, Surrey ; grafting wood of Plums. PIKE, A. V., Buxted Park, Sussex ; plants. POLACK, A. J., Pretoria, S. Africa ; seeds. POLAND, R., Ware, Herts. ; cuttings of Gooseberry 'King of Trumps.' PORTER, G. P., Wells, Som. ; plants and seeds. PRESTON, F. C., Cambridge ; seeds of *Phacelia campanularia*. REID, R. D., Auchincruive, Ayr ; plants of Strawberries. RICE, A. F. C., Newbury ; Apple graft wood 'Red Rice.' ROTHSCHILD, Captain E. DE, Exbury, Southampton ; grafts of Rhododendron. RUSSELL, L. R., LTD., Windlesham ; seeds and plants. SAUNDERS, Mrs., Green Street Green, Kent ; plants. SCRASE-DICKINS, C., Horsham, Sussex ; plants. SEXTON, C. E., Redhill, Surrey ; plants. SOPPER, Lt.-Col. F., Easter Aberchalder, Inverness ; seeds. STAWARD, R., Ware ; Apple and Pear scion wood. STEVENSON, J. B., Ascot ; plants of *Acer pennsylvanicum*. STOOKE, J. E. H., Danesmere, Hereford ; seedling Freesias. STOUGHTON, Professor R. H., Reading University ; grafting wood of Apples. STOVELL, F. W., Basingstoke, Hants. ; Rose cuttings. SUTTON AND SONS, LTD., Reading ; Polyanthus seedlings. TATTERSALL, Walton, Blackburn ; seeds. TAYLOR, F. E., Witley, Surrey ; grafting wood of Apple 'Margaret Taylor.' TROTTER, R. D., Ockley, Surrey ; seeds, corms and cuttings. TWEED, R. D., Univ. Coll. N. Wales, Bangor ; Herbarium sheets of Indian plants. UPSALA, Bot. Inst. of Sweden ; seeds. VAN HAEFTEN, Baron, Marlborough ; budding wood. WADDINGTON, Miss W., Englefield Green, Surrey ; cuttings. WALLACE, R. AND Co., Tunbridge Wells ; *Polygonatum latifolium* var. *commutatum*. WASTIE, J. F., Oxford ; budding wood of Apples and Plums. WATERER, Miss G., Penzance ; cuttings. WATSON, A. K., Norwich ; plants from N. Africa. WALEY, Captain F., Sevenoaks ; seeds, bulbs, etc. WEEKS, A. G., Limpsfield, Surrey ; plants. WEST, J. H., Guildford ; seeds. WHITTALL, Mrs., Grayswood, Haslemere ; plants. WHITTINGTON, Miss D. E., Norbury ; grafting wood of seedling Plum. WILLOX, Miss J. F., Woking, Surrey ; *Rose Aglaia*. WILSON, Miss A. E., Weybridge, Surrey ; seeds. WYATT, E. P., Northampton ; *Rhododendron macrocarpum*.

thinning out of clumps of seedlings where these occur does not increase the yield of useful sets. Similarly, the use of surface mulches to maintain moist soil conditions are somewhat unlikely to prove of very general application. Competition for soil water and nutrients must be very intense as may be judged from the figures quoted. Such competition limits the size of the sets, which are also kept relatively small by the late sowing (May).

NUMBERS OF USEFUL SETS ($\frac{1}{2}$ INCH— $\frac{3}{4}$ INCH) PER SQUARE YARD AND AS PERCENTAGES OF NUMBERS OF SEED SOWN, WOBURN, 1944.

Variety.	'Reliance' (selected).		'Ebenezer' (selected).	
	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.
Seed rate (not thinned) . . .	884 (43%)	1,497 (37%)	1,221 (52%)	1,849 (39%)

With the variety 'Ebenezer' in the sandy Wisley soil even higher figures, over 2,000 per square yard, have been recorded in certain seasons.

Nitrogenous Fertilisers tested.—In 1943 at Wisley additional nitrogenous fertiliser was applied in solution to the soil in which the seedlings grew, with adequate controls which received water only, and in 1944 the behaviour of these sets was tested. A basal dressing of 3 cwt. per acre of superphosphates, and 2 cwt. of potassium chloride (muriate) was given, so that the nitrogen was applied in the presence of adequate phosphates and potash. The varieties used were 'Brown Globe' and 'Bedfordshire Champion,' and the nitrogen was applied on two occasions, namely, June 4 and June 25, at rates equivalent to 0 (control), 1, 2 and 3 cwt. of sodium nitrate per acre. Before, and at harvest time of the sets, there was no apparent difference caused by the additional nitrogen, such as delay in ripening or prolongation of growth. Analysis, involving eight quantitative observations from thirty-two plots, failed to reveal any significant effect on total yield or upon the yield of the various size grades with either variety. On chemical analysis, the nitrogen content of sets of both varieties failed to reveal any effect of the applications made. The sets of 'Bedfordshire Champion' were grown to bulbs in 1944, in a test which similarly yielded negative results in regard to yield, and time of ripening, and other points. Thus additional nitrogen is not recommended.

The Use of Portable Glass Covers.—A keen competition for water and nutrients results from the high rate of sowing, and as glass covers increase the day temperature and limit the moisture available to plants growing under them, their use was tested. Two varieties, 'Ebenezer' and 'Ailsa Craig,' were used at Wisley in 1943 for treatments including covering from germination, covering from May 20 until small bulbs began to form (July 15), and covering from July 15 to harvest date (August 25) with exposed seedlings as controls. The order of ripening was (1) plants covered throughout the entire season, (2) covered in the early period, (3) covered later, and (4) plants uncovered. At harvest, differences were apparent in the proportion of large to small sets. With 'Ebenezer' the use of the glass covers decreased the total weight of useful sets, but increased the number of small sets: when uncovered 36 per cent. of the yield by weight was in the small grade; covered throughout 58 per cent.; covered early

64 per cent.; covered later 54 per cent. With 'Ailsa Craig' the differences were smaller but in similar directions. In 1943, a further test at Wisley was made by placing covers, from late May, over part of long strips of seedlings of 'Best of All,' 'Giant Zittau,' 'Danvers Yellow Globe,' and 'Australian Brown.' The use of the covers increased the number of useful sets with all four varieties; but a small response was noted with 'Best of All.' In both tests the 'early' maturing imported varieties, 'Ebenezer,' 'Danvers Yellow Globe,' and 'Australian Brown,' reacted more readily than the later English varieties. In 1944 a further test was made using 'Ebenezer' and combining in the test two rates of sowing, $\frac{1}{2}$ oz. and 1 oz. per square yard. Again a decreased yield of useful sets resulted with this variety, but with an increase in the proportion of small sets. The heavier rate of sowing did not cause a greater yield when covers were used, and without covers was also not profitable. In regions of somewhat higher rainfall, glass covers might be of value in limiting the water available, and their use result in a greater proportion of useful sets in the total yield. But the evidence as a whole indicates that set production in this country should be confined to the warmer and drier South Eastern areas. The Wisley results quoted above confirm and extend those of similar tests made at Rothamsted in 1942 and 1943.

Varieties Tested for Set Production.—A wide range of varieties was tested at Wisley in 1942. The area selected was of sandy soil, containing a fairly high humus content (8.8 per cent.). The soil contained free carbonate of lime, and a high content of extractable calcium with a neutral reaction (pH 7.4). Available phosphates were high, and potash at a medium/high level, but nitrogen was rather low. Twenty-five samples were tested, and later examination showed 22 varieties to be present, with two samples of 'Ailsa Craig,' 'Bedfordshire Champion,' and 'Danvers Yellow Globe' present. The rate of sowing was 4 seeds per inch of drill, drills 1 inch apart. Whilst the germination and subsequent establishment was highly satisfactory, there were wide differences in the percentage that formed bulbs. The variety 'Ebenezer' yielded 71 per cent. of the seed sown as usable sets, 'Australian Brown' 59 per cent., 'Southport Yellow Globe' 52 per cent., 'Danvers Yellow Globe' 48 per cent., 'Red Wethersfield' 32 per cent., 'Giant Zittau' 28 per cent., 'Yellow Mulhouse' 22 per cent., 'Bedfordshire Champion' A. 17 per cent., 'Bedfordshire Champion' B. 7 per cent., 'Ailsa Craig' B. 6 per cent. The sets obtained in this test were all extremely small (mean weights less than 1 gm.): the low figures quoted were not due to the formation of large sets but to the non-formation of sets. The American early varieties formed sets well at Wisley, whereas the later English varieties did not. In other tests made that year similar results were obtained. But at Rothamsted,* and at Woburn, where the yield per square yard of sets with 'Ebenezer' was lower than at Wisley, the soil and climatic conditions have permitted success with all varieties so far tested (some 40 in all), including varieties that have not been successful at Wisley, grown from the same sample of seed. Good samples of sets have been produced commercially in this country of varieties that have not done well at Wisley. In 1942, 1943 and 1944, tests were carried out at Rothamsted and Woburn in which many factors were simultaneously investigated. The varieties used were 'Ebenezer,' 'Ailsa Craig,' 'Reliance' and

* For an account of variety trials involving 38 varieties and strains, see HOLDSWORTH, M., *Ann. App. Biol.* 32, No. 1, 1945.

'Brown Globe.' Glass covers were used on some plots throughout the season; on others until July 15. Three dates of harvesting were tested, namely, mid-July, when bulb formation had taken place but before the leaves collapsed, August 4, when under the glass covers maturation of the leaves had started, and August 24, when most of the plants had died down. The glass covers caused earlier maturation of the sets. They greatly reduced the proportion of thick-necked plants liable to be formed with the later varieties without their use. Again 'Ebenezer' proved more responsive to the treatment than did 'Ailsa Craig' or 'Reliance' in regard to acceleration of development. The sets were graded and tested in the next year. The use of the glass covers had little influence on subsequent bolting; the usual effects of size and variety were apparent. There was, however, a consistent and large effect of early lifting in increasing bolting which was not in this case due to the size of the sets.

PERCENTAGE BOLTING IN 1944.

Variety.	Treatments in 1943.							
	No covers.		Covered early.		Covered late.		Covered throughout.	
	Lifted early	Lifted late	Lifted early.	Lifted late.	Lifted early.	Lifted late.	Lifted early.	Lifted late.
'Brown Globe'								
Large sets.	48	29	54	32	53	11	49	28
Small sets.	7	2	10	0	17	5	10	2
'Ailsa Craig'								
Large sets.	15	0	10	0	19	3	11	9
Small sets.	0	0	3	0	0	0	0	3

These figures clearly show that with early lifting bolting is higher in the subsequent year. A further disadvantage arising from early lifting was also observed, in that the more immature sets, of 'Reliance,' did not keep well during winter storage and higher losses were experienced. There was, thus, no evidence to support the alleged advantage of early lifting and the practice is deprecated.

Harvesting.—After lifting, the sets require adequate drying in the sun and under cover. Drying in greenhouses, with full ventilation on dry days, in the autumn sun is advantageous, for damp sets do not keep well and are liable to suffer from moulds and to sprout in storage. Wire bottom trays of fine mesh permit free aeration, or slatted board trays are similarly useful. In America* the sets are frequently dried by means of hot air currents passed through such stacking trays; an air temperature of 100° to 120° F. is used. Dried sets are more readily cleaned than moist sets.

Grading.—This is a most important operation as the size of set is vitally important if bolting is to be avoided. Useful sets do not exceed $\frac{3}{4}$ " diameter and should be around $\frac{1}{4}$ " diameter. There should be about 200 sets to the lb. weight. Small sets, less than $\frac{1}{4}$ " diameter, are liable to be lost during cultivation, and, as shown later, give lower yields, whereas it is well established that too large sets produce bolting plants.

* *Farmers' Bull.*, No. 1955, U.S. Dept. Agric.

Testing the Sets Produced.—The sets produced at Wisley were, after grading, tested in the next year, 1943, at Wisley and at Cockle Park, Northumberland County Agricultural Station, through the kind co-operation of Dr. F. T. Bennett of King's College, Newcastle, and at Auchincruive, West of Scotland Horticultural College, where Dr. B. T. Cromwell gave valued assistance. These Northern centres proved most useful testing grounds with widely different temperatures and rainfall.

Prolongation of vegetative growth was apparent in West Scotland and at Cockle Park and the following figures show the percentage ripened off (with no green leaves) :

Variety.	Wisley 15th July.	Auchincruive 9th September.	Cockle Park 11th September.
'Ebenezer' . . .	65	25	25
'Yellow Mulhouse' .	40	15	19
'Ailsa Craig' . . .	20	11	20
Average, all varieties (20 tested) . . .	43·6	23·8	16·0

The percentage of good usable bulbs judged by size and quality ripening off naturally varied widely with variety :

Variety.	Wisley.	Auchincruive	Cockle Park.
'Ebenezer' . . .	56	25	56
'James Keeping' . (modern) . . .	82	50	67
'Up to Date' . . .	11	15	2
Average all 20 varieties . . .	33	23	26

These figures exclude large bulbs obtained by cutting off the remains of the foliage.

The average yield per set planted, including cut bulbs, was 5·4 oz. at Auchincruive, 3·3 oz. at Wisley, and 2·5 oz. at Cockle Park. Varieties performed consistently. A list of the six highest yielding ones at the three centres contained only 8 names : 'Ebenezer,' 'A.I.,' 'Giant Zittau,' 'Big Ben,' 'Yellow Mulhouse,' and 'James Keeping' (modern); with 'Southport Yellow Globe' and 'Danvers Yellow Globe' giving fair yields at Cockle Park. With good conditions for ripening, high yields were obtained from the late varieties 'Big Ben' and 'Yellow Mulhouse,' but under adverse conditions they ripen too late to dry well. 'Danvers' and 'Southport Yellow Globe' ripened off early as small bulbs and were more useful, comparatively, at Cockle Park where little late spring and summer rain fell. The best variety for such purposes was 'Ebenezer.' It readily forms sets, its ripening period is short; but in warm, dry districts it may ripen off too rapidly, in cooler districts, S.W. Scotland, it has a tendency to continue to grow late in the season, and larger sized sets of this variety also have a tendency to 'split' to form double-nosed bulbs liable to disease. 'James Keeping' (modern) rapidly formed useful bulbs; it is not a widespread variety as yet, and its use leads to further con-

fusion in nomenclature with the old standard variety of that name. 'Bedfordshire Champion' and 'Ailsa Craig' were unsuited for set use.

When the weights (per 100) of the sets planted were compared with the yields obtained from them, a very close correlation was observed. The coefficient of correlation ($R = 0.582$, $P < 0.01$) was highly significant. This means that in this experiment with extremely small sets the performance of the sets was largely governed by their weight (or size), thus confirming the results that earlier workers have obtained *in the absence of bolting*. But with sets of normal size ($\frac{1}{4}$ inch to $\frac{3}{4}$ inch) bolting may seriously reduce yield and of the eight varieties named above, only 'Ebenezer' can be recommended as unlikely to bolt.

Variety trials,* in which the effects of set size and planting date on bolting and yield have also been tested, have been conducted at Rothamsted and Woburn during the years 1940 to 1942, and special selections of new low-bolting strains made with a view to obtaining both early and late varieties suitable for set work.

Costs of Production.—On demonstration plots at Wisley, each 24 square yards, with the variety 'Ebenezer' in 1944, operations were timed. Using labour provided by the Women's Land Army, the operations required, for sowing $4\frac{1}{2}$ hours, for weeding 4 hours, harvesting 6 hours, and cleaning and grading 8 hours. The actual cost of production was estimated thus: sowing $\frac{1}{4}$ oz. per sq. yd. useful sets produced at $4\frac{3}{4}d.$ a lb.; at $\frac{1}{2}$ oz. per sq. yd. at $4d.$ a lb.; at 1 oz. per sq. yd. at $5\frac{1}{2}d.$ a lb.; this cost was increased by treatment of the seed with calomel to $5\frac{1}{2}d.$, $5\frac{1}{4}d.$, and $8d.$ respectively (this mercury compound is now expensive). The cost does not include any allowance for overhead expenses but merely for the cultivation of the crop, it was estimated with yields of approximately 5 to 6 lb. of useful sets per square yard. At $\frac{1}{2}$ inch to $\frac{3}{4}$ inch diameter this represents 1,000 sets per sq. yd., from $\frac{1}{4}$ oz. per sq. yd. sowing; a 1,000 such sets may be expected to yield about 2 cwt. of onions.

Conclusion.—The investigations carried out for the Ministry of Agriculture through the Agricultural Research Council to whom we are indebted for support in the work, have shown that useful sets can be grown in this country. Particular attention must be paid to the conditions provided for the germination of the seed and to the high percentage establishment of the seedlings that is required to provide intense competition between the seedlings. Early maturing varieties are, on the whole, to be preferred and of these only one ('Ebenezer') is known to be reasonably free from bolting; early lifting before maturation of the sets is undesirable. The use of glass covers facilitates the production of small sets. Thorough drying must be carried out, and strict grading to obtain small sets $\frac{1}{4}$ inch to $\frac{3}{4}$ inch diameter is required. Given such conditions good sets result and on testing in northern and southern districts these home-produced sets have produced promising crops. It therefore appears that the importation of sets from warmer climates is not absolutely necessary if home production meets the demand.

* M. HOLDSWORTH, *loc. cit.*

EXPERIMENTS IN THE USE OF POTATO EYES FOR SEED AT KEW.

By W. M. CAMPBELL, N.D.H., and SIR GEOFFREY EVANS, M.A., C.I.E.

OWING to war conditions the transport of seed Potatoes to our dependencies overseas has presented a difficult problem and in 1942 an enquiry was instigated into the possibility of saving weight and space by utilizing cut pieces instead of transporting whole tubers. Difficulty was experienced not only in providing sufficient shipping space but, in addition, of the consignments that were sent, many frequently arrived at their destination either too late for the planting season or in a wholly unusable condition due to the delays inevitable during war time.

It must be remembered that even before the war there was a steady and increasing trade in seed Potatoes from this country to the Mediterranean countries such as Cyprus, Malta, and Palestine, and that the production had greatly increased during the war years owing to the necessity for supplying the large numbers of troops quartered in those regions.

It is also an interesting fact that the Potato is now becoming increasingly popular as an article of diet among the native populations and the movement in this direction is spreading to other parts of Africa such as Kenya and Nigeria.

It has been found necessary to renew the stocks in all these places with fresh planting material from this country, preferably each year, because locally grown seed has been found not to give satisfactory returns. The reason for this deterioration in stocks does not seem to have been fully explained and it may be due to the more rapid spread of virus and other diseases, but the fact remains that replacements are necessary and that the demand for "certified" seed is likely to increase. Although Kew is not designed for experimental work on a large scale of this nature, it was decided in view of the urgency of the matter to carry out some preliminary tests in the spring of 1943.

The problem involved the elaboration of some simple and foolproof system whereby viable planting material could be transported, by air if necessary, and an appreciable saving effected in shipping space and weight over existing methods. It was well known that satisfactory crops can be raised from small portions of the tuber and the use of single eyes has in the past been frequently made for the rapid propagation of new varieties of special merit. The problem was to get the cut seed across to the grower in these countries in a viable condition.

As most of the eyes in a Potato tuber occur at the rose end, the preliminary experiments in 1943 were designed to test the possibility of using a thin chip cut from the rose ends, to see how much saving in weight could be made by drying and whether good crops could be raised from such dried 'chips.'

The results of this experiment were published in *Nature*, October 23, 1943, and indicated that there was a possibility of raising satisfactory crops from cut rose ends dried into 'chips.' As was to be expected the yields were not quite so big as from the whole seed, being about

85 per cent., but they were nevertheless considered satisfactory, as the tubers were of excellent size and appearance with a high proportion of ware. On the other hand the weight of 'chips' (before drying) required to plant an acre was only 3 cwt. an acre against a normal war-time weight of 15 cwt. for whole tubers. These wet 'chips' lost 12 per cent. of their weight in twenty-four hours, due to drying, and about 65 per cent. after a week, so that the weight of dried chips needed to plant an acre was about 1 cwt. against a normal 15 cwt., which represented a great saving in weight. The variety used was 'Majestic,' which incidentally is not usually regarded as very suitable for cutting.

The experience gained from these preliminary trials led to further experiments in 1944 designed to solve some of the details which seemed to require further elucidation. Among these was the method of cutting and drying chips, the correct spacing and the depth of planting. The experiments were divided into three series.

SERIES I.—TO TEST THE TIME 'CHIPS' CAN BE KEPT AFTER CUTTING.

With regard to the preparation of the dried chips for export it was realized that some time must elapse between the preparation of the chips in this country and their arrival in the hands of the growers overseas. If the viability of these chips cannot be depended on after a fortnight or so then great difficulties might inevitably arise even though the seed were sent by air transport, because there are bound to be unavoidable delays before the seed can be distributed to the actual grower. The cutting and drying periods were therefore varied from six weeks to a few days.

SERIES II.—DEPTH OF PLANTING EXPERIMENT.

The method of planting 'chips' is different in some respects from normal methods. The chips must be planted much shallower than whole seed. If planted too shallow, there is danger from spring frosts, or alternatively in a dry spring there may be a set back in sprouting, as was experienced with the light soils at Kew, which are apt to dry out rapidly. On the other hand, if the 'chips' are planted too deeply the shoots may be weakened and delayed in their struggle to reach the surface.

SERIES III.—SPACING EXPERIMENT.

The spacing too is important and it was obvious from the previous year's experience that the chips require closer spacing so an experiment was designed to throw light on this point.

The variety used was 'Up-to-Date' as this is the variety which is far and away the most popular in the Colonies. Why this should be so has been the subject of enquiry, but it appears to be a fact that it does best under overseas conditions. Numerous trials with other standard varieties have been carried out, but the 'Up-to-Date' variety has almost invariably given the best results.

The soil at Kew is a poor light sand overlying gravel. The field used for the plots merely received a good dressing of leaf compost; the crop the previous year had been Carrots and other vegetables. The

field was not even, but was the best available and the rows were repeated at random in series so as to try to avoid local differences in soil fertility so far as possible.

The results are given in the tables below :—

SERIES I.—To Test Length of Drying Period.

SERIES.	METHOD.	DATE.	'CHIPS.'	WEIGHT.		TOTAL YIELD.	GRADING.			YIELD PER ACRE.
		set up.	cut.	Before drying.	Dried & planted.		WARE.	SEED.	CHATS.	
IA	4 rows 200 ft. long, 2' 6" apart, 12" between sets .	Feb. 21	Mar. 20	lb. 36	lb. 16	lb. 1,225	lb. 1,015	lb. 108	lb. 102	t. cwt. 11 17½
IB	4 rows, 200 ft. long 2' 6" apart, 12" between sets. .	Feb. 14	Mar. 13	46	16	1,467	1,190	153	124	14 5
IC	4 rows, 200 ft. long 2' 6" apart, 12" between sets .	Jan. 31	Feb. 28	36	15	1,198	961	123	91	11 4½
ID	4 rows 200 ft. long, 2' 6" apart, 12" between sets .	not set up	Apr. 18	28	28	1,222	1,030	92	100	11 17

Series IA, IB and IC were planted on April 14.

ID was planted on April 20.

SERIES II.—Depth of Planting.

SERIES	METHOD	WEIGHT OF 'CHIPS' PLANTED.	TOTAL YIELD	GRADING.			YIELD PER ACRF.
				WARF.	SEED.	CHATS.	
IIA	2 rows 200 ft. long, 2' 6" apart, 12" between sets planted 2" deep.	lb. 12	lb. 714	lb. 603	lb. 60	lb. 51	tons cwt. 13 16½
IIB	2 rows 200 ft. long, 2' 6" apart, 12" between sets planted 4" deep	11	797	686	63	48	15 10
IIC	2 rows 200 ft long, 2' 6" apart, 12" between sets, planted 6" deep	12	591	511	43	37	10 11
IID	2 rows 200 ft long, 2' 6" apart, 12" between sets planted 6" deep (normal seed) .	272	1,008	868	81	59	19 9

All plots were planted on April 17. The seed for all the plots was set up on February 21 and for the first three plots cutting was done on April 14, i.e. three days before planting. The fourth plot was planted with whole tubers of "wartime" seed size.

SERIES III.—*Spacing Experiment.*

SERIES.	METHOD.	WEIGHT OF 'CHIPS' PLANTED.	TOTAL YIELD.	GRADING.			YIELD PER ACRE.
				WARE.	SEED.	CHATS.	
IIIA	2 rows 200 ft. long, 2' 6" apart. Sets planted 9" apart in row and 4" deep	lb. 13	lb. 877	lb. 745	lb. 63	lb. 89	tons cwt. 17 1½
IIIB	2 rows 200 ft. long, 2' 6" apart. Sets planted 12" apart in row and 4" deep	lb. 11	lb. 808	lb. 677	lb. 58	lb. 73	tons cwt. 15 14½
IIIC	2 rows 200 ft. long, 2' 6" apart. Sets planted 15" apart in row and 4" deep	lb. 10	lb. 780	lb. 660	lb. 47	lb. 73	tons cwt. 15 1

In this series the seed was set up on February 21, cut on April 14, and planted three days later, i.e. April 17.

The results of these experiments can be summarized briefly on general grounds, although it is realized that owing to the limitations of the scope of the trials and to the fact that the season was in many ways abnormal, they require confirmation. The 1944 season was remarkable for the phenomenally dry cold spring, and the severe May frosts. These conditions probably had an unduly depressing effect on the 'cut' seed since these chips being planted at a less depth than whole seed could not get sufficient moisture to make good growth at the start. Owing to the shallow planting of the chips their shoots appeared above the surface before those of the whole tubers and suffered some set back from frost. Nevertheless although, at the start, the growth of cut tubers looked spindly and straggly and never likely to make a crop, by the middle of July the rows had filled in and it was difficult to distinguish from the abundance of haulm growth between the various rows.

The result confirms last year's trials in that a yield somewhat lower than from whole tubers must be expected. This season represented from 60 to 75 per cent. of the normal crop, but as explained above, this is probably lower than might be expected in an average season.

The need for "setting up" the seed and breaking the dormancy before cutting is not evident.

A suitable planting depth for dried chips would appear to be about 4 inches, although much will naturally depend on the condition of the soil and its moisture content at planting time. Properly prepared dried chips retain a high proportion of viability up to six weeks; the crops from chips dried for a month give the biggest yield and it is probably unwise to rely on those kept much longer than this unless improvements in the technique can be made. Close planting in the row has this year given the best results but with better growing conditions it is possible that a slightly greater distance might prove more suitable.

The present method of preparing the chips consists simply in slicing off the rose end of a tuber with a sharp knife. At first the slice cut off was about $\frac{1}{4}$ inch thick, but experience has shown that this is inclined to dry out too quickly and better results will probably result by taking off a slice about $\frac{1}{2}$ inch thick. The cut ends are placed in

a thin layer on a wooden floor and covered with a damp sack or cloth for a day or 48 hours. During this period a callus forms over the cut surface. The chips are then uncovered and kept in shallow trays or on wooden racks in a darkened frost-proof shed at ordinary atmospheric humidity until required for planting. During this period it is probably advisable to cover them with a thin layer of straw as this seems to break air currents and prevents too rapid shrinking by drying out.

The method received full trial by the authorities at the Midland Agricultural College at Sutton Bonnington. These trials were conducted on the above lines with a view to testing the method on a large number of varieties. The results of these trials will no doubt shortly be available.

There is little doubt that the system described results in a great saving in weight of planting material and in addition it must be remembered that at least 75 per cent. of the tubers after the rose ends have been removed will be available for processing, for feeding stuffs or for other purposes.

In the coming planting season it is proposed to confine work to a series designed to test out last season's results.

A NOTE ON ALBINO FLOWERS.

By ELEONORA ARMITAGE.

DURING a life-time spent in the country I have taken pleasure in observing and recording the occurrence of albinism in flowers. On many botanical rambles I have encountered albinos among our native plants and have preserved the specimens in my herbarium. In gardening I have often had occasion to observe albino plants in the borders, either spontaneous or planted. In the list which follows I put "G" for "garden" after these names. The natives are unmarked and the names are those in the eleventh edition of the *London Catalogue of British Plants*, 1925.

Naturally there are numerous plants of which the normal colouring of the flowers is white. In some species there is a wide variety of colouring natural to the plants. To quote only four examples:—Sweet Violets (*Viola odorata*) occur in blue, purple, crimson, pink, bluish grey, sulphur and white. Cornflower (*Centaurea Cyanus*) may be seen with white, pale pink, deep pink, blue and purple flowers. Hardy Cyclamens (e.g. *C. coum* and *C. hederæfolium*) have crimson, rose, pink and white flowers. Field Bindweed (*Convolvulus arvensis*) shows an almost equal number of pink and white flowers.

But there are true albinos, when normally coloured flowers occasionally sport into white. In such plants it will be found that the stem and foliage are always *pure green*. In the typical form there is always some coloured pigment present, it may be red, brown or purple. Sometimes the flowers are near-white, for example one has to look closely into some heaths. The point is illustrated in a white flowered variety of a *Primula juliae* hybrid. The flower is quite pure white, but the cloven hoof is shown in the reddish petiole of the leaves, and the red pedicel and calyx of the flowers. The absence of colouring matter other than chlorophyll is the criterion.

Then I have noticed that with yellow or golden flowers an occasional plant will bear lemon or cream-coloured flowers, always the whole crop of flowers on that individual plant. But these never bear white (= albino) flowers, and the herbage is not distinctly green. This is markedly noticeable in the Lesser Celandine (*Ranunculus Ficaria*) and also in the Buttercup (*R. acris*). The pale colouring is also found in some yellow composites, such as Sow Thistles (*Sonchus oleraceus* and *S. asper*).

In the list which follows, with about a hundred examples, the names are arranged alphabetically for easy reference.

The Fellows are sure to have met with many other instances.

<i>Ajuga reptans</i>		<i>Hesperis matronalis</i>	G
<i>Anchusa officinalis</i>	G	<i>Iris sibirica</i>	G
<i>Antirrhinum majus</i>	G	„ <i>Variani</i>	G
<i>Aquilegia vulgaris</i>	G	<i>Jasione montana</i>	
<i>Armeria maritima</i>		<i>Lamium purpureum</i>	
<i>Ballota nigra</i>		<i>Lathyrus latifolius</i>	G
<i>Calamintha clinopodium</i>		<i>Lavandula vera</i>	G
<i>Calluna vulgaris</i>		<i>Linaria cymbalaria</i>	G
<i>Campanula carpatica</i>	G	<i>Linum perenne</i>	G
„ <i>grandis</i>	G	<i>Lucaria biennis</i>	G
„ <i>latifolia</i>	G	<i>Lychnis alpina</i>	G
„ <i>persicifolia</i>	G	„ <i>dioica</i>	
„ <i>pusilla</i>	G	„ <i>Flos-cuculi</i>	
„ <i>rotundifolia</i>		<i>Lychnis Githago</i>	G
„ <i>Trachelium</i>		<i>Malva moschata</i>	
„ <i>urticaefolia</i>	G	<i>Muscari botryoides</i>	G
<i>Carduus nutans</i>		<i>Myosotis alpestris</i>	G
<i>Centaurea Scabrosa</i>		<i>Ononis repens</i>	
„ <i>nigra</i> (agg.)		<i>Ophrys apifera</i>	
<i>Centranthus ruber</i>		<i>Orchis maculata</i>	
<i>Cichorium Intybus</i>		„ <i>mascula</i>	
<i>Cnicus arvensis</i>		„ <i>Morio</i>	
„ <i>acaulis</i>		<i>Papaver Rhoeas</i>	
„ <i>lanceolata</i>		<i>Pedicularis palustris</i>	
„ <i>palustris</i>		„ <i>sylvatica</i>	
<i>Cynoglossum amabile</i>	G	<i>Polemonium caeruleum</i>	G
<i>Daphne Mezereum</i>	G	<i>Polygala vulgaris</i>	
<i>Delphinium Ajacis</i>	G	<i>Primula acaulis</i>	
<i>Dianthus barbatus</i>	G	<i>Prunella vulgaris</i>	
„ <i>caryophyllus</i>		„ <i>grandiflora</i>	G
„ <i>deltoides</i>		<i>Pulmonaria officinalis</i>	G
„ <i>plumarius</i>		<i>Raphanus raphanistrum</i>	
„ <i>superbus</i>	G	<i>Scabiosa succisa</i>	
<i>Digitalis purpurea</i>		<i>Scilla non-scripta</i>	
<i>Epilobium angustifolium</i>	G	<i>Stachys Betonica</i>	
„ <i>hirsutum</i>		„ <i>sylvatica</i>	
„ <i>montanum</i>		<i>Thymus serpyllum</i>	
<i>Erica cinerea</i>		<i>Trifolium incarnatum</i>	
„ <i>tetralix</i>		„ <i>pratense</i>	
„ <i>vagans</i>		<i>Valeriana officinalis</i>	
<i>Erodium cicutarium</i>		<i>Verbascum Lychnitis</i>	
<i>Erythraea centaurium</i>		<i>Veronica agrestis</i>	
<i>Fritillaria Meleagris</i>		„ <i>hybrida</i>	G
<i>Galactites tomentosa</i>		<i>Vicia angustifolia</i>	
(Madeira Thistle)		„ <i>sepium</i>	
<i>Galeopsis Tetrahil</i>		<i>Vinca major</i>	G
<i>Gentiana campestris</i>		„ <i>minor</i>	G
<i>Geranium pratense</i>	G	<i>Viola sylvestris</i>	G
„ <i>pusillum</i>		„ <i>Riviniiana</i>	G
„ <i>Robertianum</i>		<i>Wistaria sinensis</i>	G
„ <i>sanguineum</i>			

THE LEOPARD MOTH.

By G. FOX WILSON, Entomologist, R.H.S. Laboratory, Wisley.

It is noteworthy that the Leopard or Wood Leopard Moth, *Zeuzera pyrina* L. (*aesculi* L.), is becoming of increasing importance among the lesser orchard pests, and the number of enquiries concerning its depredations to fruit and ornamental trees has markedly increased during recent years. It is thought advisable, therefore, to give a brief account of the pest, its distribution, food plants, nature of damage and measures of control.

Distribution.—MEYRICK (*Revised Handbook of British Lepidoptera*, 1927) states that this species occurs in "Britain to Ross, Ireland, rather common." It is more abundant in the southern and south-eastern counties of England, and is common in the London district, where it often causes damage to trees in public parks and even in gardens well within the city boundary. It has a wide distribution, including central and southern Europe, Asia Minor, North Africa, southern Siberia, Korea and Japan, and has become established in the north-eastern United States of America since about 1860.

Specimens of damaged trees have reached the Society's Laboratory within the past twelve years from twenty English counties, chiefly from Hampshire, London, Middlesex, Surrey and Sussex.

Host Plants.—While some sixty odd species of trees have been recorded as hosts, the Leopard Moth shows marked preference for certain trees, namely Apple among the cultivated fruits.

It was considered at one time to be partial to Chestnut, from which the earlier name *aesculi* was derived, but the number of records on this tree are considerably fewer than on fruit trees. This is probably due to the fact that less attention is paid to *Aesculus* than to either fruit trees or to other ornamental trees and shrubs.

Considerable attention has been paid to this pest in the Ukraine, where it has long been recognized as a serious menace to forest stands, and in Palestine, where it is a major pest of Olive trees. It has also been recorded from Spain in Carob (*Ceratonia Siliqua*) and from North Africa in Pomegranate.

The following host list is based upon infested material submitted to Wisley, and indicates the wide range of its food plants.

Host Plant.	No. of Enquiries.	Host Plant.	No. of Enquiries.
<i>Acer Negundo</i>	1	Hornbeam	1
<i>Amelanchier canadensis</i>	1	Horse Chestnut	1
Apple	32	<i>Ilex Fargesii</i>	1
Ash	1	Lilac	2
Beech	1	Mountain Ash	1
Black Currant	1	Oak	2
Cherry	1	Pear	1
Crab Apple	3	Plum	1
<i>Crataegus Carrierei</i>	1	<i>Pyracantha atalantioides</i>	1
Elm	1	<i>Pyrus</i> (ornamental species)	5
Gooseberry	1	Quince	1
Honeysuckle	1	<i>Rhododendron ponticum</i>	1

It is known to attack other trees in this country, notably :

Alder	Holly	Poplar, Black	Walnut
Aspen	Lime	and Lombardy	Whitethorn
Hazel	Maple	Sycamore	Willow

Nature of Damage.—The presence of the tunnelling caterpillar is usually first detected by a mass of brown pellets of 'frass' and sawdust, which are ejected from the lower end of the burrow on to the ground or on to the lower limbs of an attacked tree. Where the leaves of an infested branch wilt and turn yellow during the growing season, a careful examination of the limb should be made for the culprit. Broken and hanging shoots and branches above and near healthy shoots should likewise be examined.

The young caterpillars first attack the upper portion of a tree or bush, entering the twigs where they feed until they have exhausted the available food, or until they have grown too large, when they move down and enter the thicker branches and the stem. Damage to the twigs and spurs of Apple by the very young caterpillars closely resembles that caused by the Fruit Bark Beetle, *Scolytus rugulosus*. An attack on a Gooseberry bush under the author's observation clearly demonstrated this habit of the young larvæ in concentrating their attack on the young shoots until food requirements forced them to move down into the lower branches, while some chose the main stem in which to complete their development.

Description and Life Cycle.—The moths are striking insects by reason of their size and their transparent white wings, which are covered with a large number of bluish-black spots. The male has a wing expanse of 2 inches, while the female is larger and measures 2-3 inches across the wings and may be recognized, also, by the horny ovipositor that is often seen extruded from the body (Fig. 49, c). They are on the wing from June to September, but chiefly in June and July.

The orange-yellow eggs are laid singly or in small batches of three to four in cracks in the stem and branches, beneath peeling bark, in wounds and around Apple spurs. Each female is capable of laying several hundred eggs—some 400-500 eggs having been dissected from a gravid female.

The caterpillar is yellowish-white with black spots and short black bristles. Its head is brown and there is a prominent horny, chestnut-coloured, dorsal thoracic plate immediately behind the head which shields the softer portions of the body during burrowing operations (Fig. 49, a). The young larvæ wander about for a time before feeding below the bark of the younger shoots. As they develop, they move to the larger branches and limbs, while some may enter the main stem. They differ from the caterpillars of the Goat Moth in that they prefer younger to older trees, being seldom found, for instance, in the large pollarded stems of Willow and in the stout bolls of hardwoods. They tunnel through the wood, forming galleries of 8 to 12 inches in length (Fig. 50), so that the branch is weakened and is apt to snap off during high winds. Feeding may cease when the temperature is low during the winter months, but continues throughout the year in the higher winter temperatures of southern Europe, North Africa and Asia Minor. The temperature factor affects the length of the caterpillar's life, which varies from 10 months to 2 to 3 years.

The fully fed caterpillar measures some 2 inches in length and, each descending its own particular gallery, forms a cocoon of silk mixed with sawdust just below the bark and near to the opening of the tunnel.

The pupa pushes its way partially from the aperture to facilitate the emergence of the adult moth—the empty pupa-case frequently being seen protruding from the tunnelled branch (Fig. 49, b).

Under forest conditions, unfavourable soil renders a tree more liable to attack, and trees without too great a flow of sap are definitely preferred.

While parasites of the caterpillar have been recorded, no case of parasitism has occurred among the many specimens bred at Wisley, and the only natural enemy that has been observed by us is the Green Woodpecker, which has been seen seeking the caterpillars in their tunnels.

Control Measures.—While it may be necessary to remove and burn the attacked branch, which should be cut back to a point below the larval gallery, this measure may be too drastic in the case of ornamental trees where the preserving of form and shape is desirable. An attempt should then be made to stab the tunnelling caterpillar with the aid of a piece of flexible wire, which should be inserted into the aperture, though this procedure will be ineffective when the gallery is irregular and tortuous.

The most effective method without resorting to amputation of the affected limb, is to kill the caterpillar within its gallery by inserting into the hole a few crystals of paradichlorobenzene or cotton-wool soaked in carbon disulphide (*highly inflammable*), after which the hole is stopped with clay, putty or grafting-wax to conserve the fumes.

It is most desirable to plug the hole permanently after the caterpillar has been killed to prevent rain from entering the wound and setting up decay and to exclude insects, some species of which may enter the wounded branch and extend the initial injury.

My sincere acknowledgements are made to my colleague, Mr. F. C. BROWN, for the photographs illustrating this note.

THE ORIGIN OF APPLE 'ELLISON'S ORANGE.'

FOR the popular dessert Apple 'Ellison's Orange' we are indebted to the Rev. CHARLES CHRISTOPHER ELLISON (1835–1912), vicar of Bracebridge, Lincolnshire, at the end of the last century. He was fond of cricket, shooting, fishing and gardening, and was not only a keen fruit grower but also a great rosarian like his friend and one-time neighbour, Dean HOLE. About 1890 Mr. ELLISON decided to try his hand at raising a dessert Apple, presumably one with good flavour and an earlier season of use than 'Cox's Orange Pippin,' and he discussed the matter with Mr. WIFF, the gardener at Hartsholme (*not* "Hartshorne") Hall, then occupied by Mr. ELLISON's brother-in-law, Mr. A. SHUTTLEWORTH. The two decided that the most likely way to attain the desired object would be to cross 'Cox's Orange Pippin' with 'Calville Blanche' and that was accordingly done. Who did the crossing is not known to Mr. ELLISON's son or anyone whom I have been able to consult, but the resulting seedling, which was eventually called 'Ellison's Orange,' fruited in the garden of the old Bracebridge Vicarage, which was renamed "The Manse" when Mr. ELLISON retired about 1900. Whether WIFF merely gave advice, or took an active part in the raising and propagation of the seedling is not recorded, but when, in 1908, Mr. ELLISON wrote to some of the leading nurserymen inviting offers

for "about 600 good grafts—probably 1,000 could be found," he said, "I desire to sell to the highest bidder for the benefit of the gardener (not my own) who helped me to raise it." Most of the firms approached declined to bid, but the stock was purchased and the variety distributed by Messrs. Pennell & Sons. The original tree has long since been uprooted to make way for a housing estate.

In the contemporary manuscripts, notably those of Mr. OWEN THOMAS (upon whose advice Mr. ELLISON acted in distributing trees for trial and in eventually disposing of the stock) and also in printed records, the second parent is invariably given as either 'Calville Blanc' or 'Calville Blanche' (the French themselves have never been unanimous on the gender of Calville) and no one seems to have thought it worth while to say whether they meant 'Calville Blanche d'Été' or 'Calville Blanche d'Hiver.' HOGG gives 'Calville Blanche' as a synonym of 'Calville Blanche d'Hiver' but not of 'Calville Blanche d'Été.' However, in view of the season of 'Ellison's Orange' it seems highly probable that it was the Summer Calville which was used.

A. SIMMONDS.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1944-5.

Cymbidium × 'Jean Brummitt.' A.M. January 9, 1945. This interesting hybrid between *C. Devonianum* and *C. eburneum* bore a pendent spike of 10 flowers, the sepals and petals bronze-red, the labellum deep crimson. Raised by Mr. J. Brummitt, Banbury, and exhibited by Messrs. Sanders, St. Albans. See p. xxvi.

Cypripedium × 'Battle of Egypt' var. 'Alpha.' A.M. December 5, 1944. The large flower has the dorsal sepal of rich rose-purple colour, with darker venation. The result of crossing *C. 'Red Start'* with *C. 'Miracle.'* Exhibited by Messrs. Sanders, St. Albans. See p. xxv.

Cypripedium × 'Cradillon' var. 'Miona' A.M. January 9, 1945. A well-shaped flower in which the dorsal sepal is much suffused with rose-purple, the petals and labellum reddish-brown. The result of crossing *C. 'Cramore'* with *C. 'Lady Dillon.'* Exhibited by Messrs. Charlesworth & Co., Haywards Heath. See p. xxvi.

Cypripedium × 'Judith Dance.' A.M. December 5, 1944. The large flower is of an unusually bright purple colour, the dorsal sepal marked with crimson veins, and the petals mahogany red. The parents are *C. Hassallii* and *C. 'Hestia.'* Exhibited by Mr. D. A. Cowan, 118 Hook Rise, Surbiton. See p. xxv.

Cypripedium × 'Silver Wings.' A.M. December 5, 1944. The segments of this charming flower are all broadly developed, and are white with slight greenish tints on the basal areas. Raised and exhibited by Lord Aberconway, Bodnant, Tal-y-Cafn, Denbighshire, the parents being *C. 'Vestalia'* and *C. 'F. C. Puddle.'* See p. xxv.

Cypripedium × 'Vista' var. 'Excelsior.' A.M. December 5, 1944. The dorsal sepal of this large flower is much spotted with red-purple, while the broad petals and labellum are yellowish with red-brown suffusion and markings. The result of crossing *C. 'Cardinal Mercier'* with *C. 'Openshaw.'* Exhibited by Messrs. Sanders, St. Albans. See p. xxv.

Odontoglossum × 'Goldbeam' var 'Luna.' F.C.C. January 9, 1945. The erect spike bore eight medium-sized flowers of light orange-yellow colour, the central area of the petals less coloured. The result of crossing *O. 'Rêve d'Or'* with *O. 'Goldstar.'* Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. See p. xxvi.

BOOK NOTES.

"The Genus *Oxalis* in South Africa." By T. M. Salter. 4to. 355 pp. Illus. (Cape Times Ltd., 1944.) 35s.

(May be obtained from the Editor, *Journal of South African Botany*, Kirstenbosch, Newlands, C.P., S. Africa.)

The genus *Oxalis* is very well represented in the South African flora, but there has been considerable confusion in the nomenclature, partly due to the fact that the importance of the bulb for taxonomic purposes was not recognised at first so that this feature is often missing from early herbarium specimens, and partly on account of the wide variations found in some species which could only be appreciated by work in the field. Captain Salter has travelled 40,000 miles in his search for *Oxalis* and is in a position to realize that whereas the two extremes of a variable group may be sufficiently distinct to be regarded as distinct species, yet when the intermediate forms are present it becomes obvious that only one species is involved. Later workers on *Oxalis* will have cause to be very grateful to the author of this revision for his painstaking sorting of the data, and also for the fact that he has very materially reduced the number of species into which the genus has been divided. There are probably many more species of *Oxalis* still to be discovered in South Africa, for they tend to be localised, and there are large tracts of roadless country still to be explored. But whoever continues the work on *Oxalis* in future years will have the great advantage that the ground behind them has been swept clear of many incumbrances by Dr. Salter, and it is to be hoped that they will follow his good example of preferring living to herbarium material wherever possible.

"Trees and Shrubs throughout the Year." By Blanche Henrey, text by W. J. Bean. 4to. 58 pp. and 88 plates. (Lindsay Drummond, 1944.) 21s.

Miss Henrey's earlier book "Flower Portraits" showed her skill as a photographer of plants. Here the subjects are trees and shrubs; cut sprays have been cleverly arranged to show the habit of each plant and studio photography has thus made possible a full control of lighting such as is impracticable when photographing a growing bush in a garden. Some people dislike the method of printing illustrations without white margins, but here the decorative pattern seems rather to be enhanced by this treatment; where branches go right across the page one gets a feeling of looking at a part of a larger whole, a part of a large design, as it were, and the effect is very pleasing. Eight of the plates are in colour, which in most cases is a faithful reproduction of the original. Such a series of photographs would in itself be excuse enough for a book; but these are supplemented by text written by W. J. Bean, who has given a useful chapter on Cultivation and descriptions of each of the subjects illustrated.

"Tomato and Cucumber Culture." By A. A. Richards. Sm. 8vo. 127 pp. Illus. (Collingridge Ltd., 1945.) 5s.

Mr. Richards has been Nursery Manager at the Cheshunt Research Station for many years and has therefore a wide knowledge of the subject from the practical side; his object in writing this book is to help the amateur and the beginner to adopt the best modern methods of cultivation. The subject is dealt with very thoroughly, alternative methods of cultivation being given in houses specially constructed or old ones adapted for the purpose. Suitable varieties are discussed and the treatment at all stages is given simply and in detail.

"The Diagnosis of Mineral Deficiencies in Plants, Supplement 1944." By T. Wallace, M.C., D.Sc., A.I.C. 8vo. 48 pp. Illus. (H.M. Stationery Office, 1944.) 5s.

The original publication was noticed in the JOURNAL (September, 1943); its importance has been realised and its usefulness is now extended by the addition of 95 additional plates showing mineral deficiencies in a further range of crops. Nitrogen deficiency, which was not included in the main edition, finds a place here. There is also a list of the colour plates in both the main edition and the supplement.

Books noted in this JOURNAL can be obtained direct from the publishers or through any bookseller; the R.H. Society's Office supplies only those books and pamphlets which have been issued by the Society.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part 6

June 1945

THE SECRETARY'S PAGE.

Programme of Meetings.—Meetings with Shows will be held in June and July as follows :

Tuesday, June 19	.	.	12 noon-5 P.M.
Tuesday, July 3	.	.	12 noon-5 P.M.
Tuesday, July 24	.	.	12 noon-5 P.M.

The following competitions will be held in conjunction with the above Shows :

On June 19—for Flowering Shrubs.

On July 3—for Lilies and for Fruit grown in the open air.

On July 24—for Fruit and Vegetables, for Border Flowers (bulbous plants excluded) and for the Clay Cup for the best scented Rose. Particulars of these competitions can be obtained on application to the Secretary. The Competition for Flower Arrangement is postponed until later in the year.

Lectures.—The following lectures, in conjunction with the above Meetings, will be given at 2.30 P.M. in the Lecture Room of the New Hall :

On June 19—"The Rose Garden after War," by Mr. G. M. TAYLOR.

On July 3—"Lilies," by Mr. R. WALLACE.

On July 24—"Difficult Plants for the Enterprising Amateur," by Mr. D. WILKIE.

Demonstrations at Wisley.—During June and July the following demonstrations will take place at Wisley :

Flower Garden.

June 6, 7 . . . Summer Pruning of Shrubs . . . 2-4 P.M.

Fruit Garden.

July 11, 12 . . . Summer Pruning of Fruit Trees . . . 2-4 P.M.

Fellows and Associates desiring to attend should notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

How to get to Wisley.—Fellows and Associates desiring to travel from London to Wisley should take a train from Waterloo to Esher and there pick up the bus No. 215, which will stop on request at the turning for the Gardens on the Portsmouth Road. For the times of the bus No. 215, inquiries should be made at the London Passenger Transport Board, 55 Broadway, London, S.W. 1 (Tel. Abbey 1234), and for particulars of the trains, the current time-table should be consulted or inquiries made at Waterloo Station (Tel. Waterloo 5100).

Kindred Societies.—The National Carnation and Picotee Society will be holding a competition for Pinks in conjunction with the Show on June 19. On the occasion of the Show on July 3 there will be a competition for Delphiniums, held by the British Delphinium Society, a competition for Sweet Peas, organized by the National Sweet Pea Society, and a competition for Border Carnations, held by the National Carnation and Picotee Society. The National Carnation and Picotee Society will also be holding a competition for Border Carnations in conjunction with the Show on July 24.

Rose Show.—The National Rose Society will be holding a Show in the Society's Old Hall on Friday, June 29 (12 noon to 6 P.M.) and Fellows will be admitted free of charge on presentation of their R.H.S. tickets.

Rules Governing Trials at Wisley.—Attention is drawn to the Rules governing trials at Wisley, which have been revised and are now printed in this number of the JOURNAL for the information and guidance of persons desiring to submit plants, etc., for trial.

Subscriptions.—The Secretary desires to draw the attention of the Fellows and friends of the Society to the following bye-law :

“ A Fellow, if elected on or after the 1st of July and before the 1st of October, shall pay half a year's subscription.”

Should a full subscription for the year be paid every endeavour would be made to supply the back numbers of the Journal, although some of them are in short supply. Forms for application for Fellowship are obtainable from the Society's Office.

WISLEY IN JUNE.

In a season characterized by such violent extremes of weather as have been experienced this year it is far from easy to estimate the future behaviour of many of the summer-flowering plants, although the unfortunate effect upon the fruit crop of the frost and snow which attended the passing of April is only too apparent. The more susceptible shrubs, flowering in advance of their normal time, also suffered damage, but one may expect the later Rhododendrons on Battleston Hill, the collections of *Cistus* and *Helianthemum* near the Alpine house and in Howard's Field, and the Roses, to give a good account of themselves during the present month.

Trials and collections of herbaceous plants form another attractive feature. Delphiniums at the upper end of the Dahlia borders, bearded Irises, and Chinese Paeonies near the old Pear orchard will merit inspection. The Lupins have been replanted recently and will be less showy than they were last year. The number of flowers in the herbaceous borders is still small, but already splashes of vivid colour are

formed by the Oriental Poppies, various *Anchusas*, the magenta *Lychnis Flos-jovis* and *Lysimachia punctata* with spires of golden blossoms. *Salvia Sclarea*, and the equally floriferous but quite distinct *S. superba* and *S. haematodes* cannot be too highly recommended for massing in sunny spots.

To many visitors the Rock garden is most attractive now, and at no time does it present a greater variety of flowers. Helianthemums are particularly gay, daily renewing their display of frail blossoms, and many different 'Pinks,' such as the dwarf rose *Dianthus arvernensis*, the small, white, fringed *D. squarrosus*, the blood-red 'Spark' and the larger 'Icombe Hybrid' pleasantly scent the air. Some other conspicuous plants are the dazzling scarlet *Verbena chamaedryfolia*, *Anagallis collina* of intense Nasturtium-red, *Mimulus cupreus*, whose rich colour contrasts well with the yellow of the half-wild *M. luteus* growing near the ponds, and *Achillea clypeolata* with enduring golden heads above a mat of fine grey foliage. Some others of distinction are *Incarvillea Delavayi*, with large, crimson trumpets on sturdy scapes, *Nomocharis aperta*, freely producing saucer-shaped, rose-coloured flowers in a cool, shaded border beside the upper walk, *Roscoea Humeana* with rich purple, Orchid-like flowers coming in a sheaf from a cluster of glossy leaves, and *Nierembergia rivularis* forming a mat of small, heart-shaped leaves and large, Convolvulus-like blossoms. Among the shrubs which add interest at this season we may note *Chrysanthemum praeteritum*, a dense bush of finely cut grey leaves from which rise numerous long-stalked white Daisies, *Rhododendron indicum* var. *balsaminaeflorum*, an almost prostrate, double-flowered, salmon, Azalea, the hybrid *Cistus* 'Silver Pink,' and *Veronica cupressoides*, now covered with tiny, whitish blossoms.

The Alpine house is still very bright. The first Campanulas to appear include the lovely, china-blue *C. Bellardii* 'Miranda,' the very free-flowering purple hybrid *C. rotarvatica*, *C. incurva* with immense, silvery-lilac bells, and *C. fenestrellata*, similar to the familiar *C. garzanica*. Some of the more uncommon plants flowering now are *Ourisia microphylla*, a gem with prostrate stems covered with small, scaly leaves and larger pink flowers suggesting a miniature Phlox, *Craspedia uniflora*, a yellow-headed Composite with spatulate leaves, entirely covered with densely felted white wool, *Allium Christophii*, a lilac-flowered species whose persistent perianth gradually becomes pale and papery, *Dracocephalum grandiflorum* with long, grey-blue flowers in dense heads and nettle-like leaves, and the large-flowered Butterwort *Pinguicula caudata*.

A number of excellent shrubs now flowering in the Wild garden includes a trio of sweetly-scented Rhododendrons; two deciduous North American species *R. viscosum* and *R. arborescens*, both with white or blush, tubular blooms, and the larger, lilac-coloured hybrid *R. azaleoides* whose parentage is unknown, although it is thought to have arisen from a cross between *R. ponticum* and a deciduous species, possibly *R. viscosum*. *Magnolia Watsonii* and *M. Sieboldii* will still be flowering, and the delicately scented, creamy blooms of the half-evergreen *M. virginiana* will soon appear. *Chionanthus virginica*, growing in a nook opposite the bog garden, is one of the most striking small trees when covered with panicles of lacy, white flowers, and other good things are *Kalmia latifolia* and its compact, small-leaved variety *myrtifolia*, *Zenobia pulverulenta* with glaucous leaves and waxy-white bells, and *Gaultheria* 'Wisley Pearl,' a hybrid between *Gaultheria*

Shallon and *Pernettya mucronata*, most ornamental in flower and later bearing heavy crops of purplish-red berries.

Primulas of the *Candelabra* section continue to flower during the first half of the month, giving place later to the tall, mop-headed *P. Florindae*, seen at its best in ditches where its roots are in no danger of becoming dry. Some of the earlier Lilies one may expect to see now are *L. rubellum*, with bright, rose-pink, trumpet-shaped flowers, *L. Szovitsianum*, bearing heavy yellow flowers of the 'Turk's-cap' form on stems often reaching six feet or more, and *L. pyrenaicum*, of more modest stature and somewhat dull hue.

The Heath garden is less colourful now than at other times, for the Spring-flowering kinds are over and the varieties of Bell-Heather are not usually at their best before the end of the month; but the tiny, Heath-like sprays of *Bruckenthalia spiculifolia* may be found, and there is a good specimen of *Rhododendron ferrugineum*, the 'Alpine Rose,' together with its white variety. A large bush of *Genista cinerea* covered with fragrant, golden blossoms is the most conspicuous plant in Seven Acres. This, and *Spartium junceum*, growing close by, are excellent for sunny positions on dry soils. In the west border there are many Philadelphia species and hybrids, and others are to be found near the Azalea garden.

Howard's Field is worth a visit, to see the many species and hybrids of *Cistus* and *Rosa*, as well as *Spiraeas* and other shrubs. Crossing the road in Wisley village it is but a few steps to the Vegetable Trial Ground, where over one hundred stocks of culinary Peas, raised from seed sent from the U.S.A., are growing. Here, too, a large plot is devoted to a trial of Lettuces of the crisp, heading type. Although known to many amateurs these are not grown to any extent in the south of England.

GARDEN WORK.

REMINDERS FOR JUNE.

Vegetable Garden.—Continue to earth maincrop Potatoes immediately the foliage reaches the correct stage. Other routine work consists of the timely thinning of vegetable seedlings, hoeing, mulching, staking Peas and Runner Beans, also watering should this operation become necessary.

The first week in the month is early enough to sow Ridge Cucumbers direct into the position they are to occupy in the open garden.

The Garden Swede is valuable for storing as a winter vegetable and should be sown about the second week of the month. Thin, in the first instance immediately the seedlings can be handled, which is usually about twenty days after sowing.

During the first week make a sowing of Carrots for storing, and repeat during the last week of the month.

Make successional sowings of Dwarf French Beans in the second week, and Runner Beans and Vegetable Marrows during the third. It is recommended that a further sowing of Round Beetroot be made at the end of the month.

The early part of June is usually late enough to sow Peas in all but the favoured parts of the country. It is advisable to use a reliable early-maturing variety for this sowing. Continue to make successional sowings of Lettuces.

Weather conditions permitting, endeavour to plant out Tomatoes, Vegetable Marrows, Ridge Cucumbers and Sweet Corn during the first week, provided the plants have been thoroughly hardened.

Transplant Cauliflowers and Cabbages as the plants become large enough and, where a sowing of Brussels Sprouts for late supplies has been made, the plants should be in their permanent positions before the end of the month.

Celery and Celeriac can be planted out any time during the month as the plants become large enough. If required, a few Leeks for early supplies can be transplanted towards the end of the month.

Tomato plants should be provided with stakes at planting time, and attention to the removal of side-shoots and tying will be necessary before the end of the month.

The cutting of Asparagus should cease about the 20th of the month, in order to allow the plants to build up good crowns for subsequent crops.

Fruit Garden.—Trained trees of Apricots, Sweet Cherries and Plums growing on walls require attention during this month as regards pinching and tying of the new shoots. Tie in young shoots where there is room for extension of the branches or bare places to furnish. Shoots not required for these purposes should be pinched at about the fourth good leaf; surplus shoots and those of excessive vigour should be removed entirely.

If the disbudding of Peach and Nectarine trees has been carried out correctly, the retained growths should be tied in as they develop, spacing them about 3 inches apart.

As the Morello Cherry fruits mainly on shoots made the previous year, reserve a sufficiency of these and tie in as recommended for Peaches and Nectarines; surplus shoots can be removed.

At this period a careful watch must be kept on the water requirements of all fruit trees growing on walls; showers and light rain have little beneficial effect. Apply water copiously, but the frequency of this operation will be much reduced where trees have received a good mulching.

Towards the end of the month is not too early to summer prune Gooseberries and Red Currants. Shorten the lateral shoots to about the fourth good leaf, leaving the leaders unpruned.

When picking green Gooseberries endeavour to thin the fruits rather than strip the bushes, especially in the case of those known to be of good flavour when ripe; this will have the effect of increasing the size of the fruits retained for dessert purposes.

Where Apple and Pear trees have set very heavy crops a start can be made this month to relieve the branches of some of the surplus fruits by removing malformed and undersized fruits in the first instance before the "June drop" has taken place. Final thinning should not be done until next month.

Where it can be seen that Apples are attacked by the Apple Sawfly or Codlin Moth the fruits should be gathered and destroyed. Periodical collecting of attacked fruits lying on the ground should be maintained during the season.

Black Currant bushes showing symptoms of Reversion should be marked with the object of removing and destroying them immediately the crop is gathered.

Flower Garden.—Seasonable weather prevailing, Dahlias and other tender flowering plants raised under glass should be planted out into

their flowering positions as early as possible in the month, provided they have been hardened. Prepare the plants by thoroughly watering beforehand.

As soon as Flag Irises have flowered is a good time to transplant where this operation is considered necessary. Care should be taken not to plant the rhizomes too deeply.

The Rose Garden will require a fair amount of attention at this period: blooms should be removed immediately they have faded. A careful watch should be kept for the appearance of Aphis and Mildew and immediate steps taken for their control.

Remove faded blooms from Azaleas, Lilacs and Rhododendrons.

Cold Greenhouses and Frames.—Frames which have been used for hardening tender plants should now be free and, where suitable, can be utilized for the growing of such crops as Tomatoes, Cucumbers and Melons, plants of which should have been raised for this purpose, or they might be purchased.

Tomatoes planted in greenhouses early last month should be making good headway, and constant attention should be given to the removal of side shoots and to tying. As these plants are growing under cold greenhouse conditions, endeavour to ventilate freely on all favourable occasions. Water the plants carefully and maintain moist conditions without an excess of moisture. To assist the fruit in setting, about midday gently tap the stakes or wires in order to cause the pollen to disperse; at the same time, during fine days, a slight misting of the plants with water should prove helpful. It is most important to secure the set of the first truss, after which the plants can be fed as necessary.

Immediately the bunches on Grape vines have set, the surplus ones should be removed, first taking off the small and badly shaped bunches, retaining a small surplus over actual requirements in case of accidents. Never overcrop the rods, as this is often the cause of some of the troubles to which vines are subject. Immediately it can be seen that the berries are swelling, thinning of these should commence, using a special pair of scissors for this work. As it is rather a tedious job, it is important to start this operation in good time: the berries swell very quickly at this stage, and by the time the last bunch is reached it will be getting towards the stage when thinning becomes difficult. During this period maintain a fairly high temperature, also a humid atmosphere by damping down the border and floor spaces as frequently as weather conditions permit. Examine the border as to the water requirements, and when water is applied this should be sufficient to thoroughly soak the border.

In order to assist in keeping the trees free from Red Spider, Peaches and Nectarines will require thorough syringing of the foliage, both in the morning before the sun gains much power and again in the evening towards sunset. Make certain that the borders do not suffer from lack of water, and maximum ventilation is usually necessary at this period. Continue to regulate and tie in the young growths as these develop and, where surplus fruits exist, these should be reduced gradually to the quantity required, when it can be seen that "stoning" has taken place. About one fruit for every 9 square inches of the tree is sufficient for Peaches; a few more can be allowed in the case of the smaller Nectarines.

MAGNOLIA SARGENTIANA AND M. S. VAR. ROBUSTA.

By LORD ABERCONWAY.

FOUR plants of these Magnolias raised by Monsieur CHENAULT, the nurseryman at Orleans, from seed sent from China by WILSON, grew: one plant of each in the raiser's nursery, and one plant of each in his private garden. As seen by me before they flowered, they appeared to be very similar except that *M. S. var. robusta* was, in each case, the more fastigate of the two.

Scions from both these plants were grafted on a large scale, and distributed by CHENAULT to nurserymen in this country. A certain amount of confusion arose in the handling of the grafts, and in some cases *Magnolia Sargentiana* was sold under the name of *M. S. var. robusta*, and vice-versa.

There are obviously two different plants, at any rate from a garden point of view. The one which I will call *Magnolia Sargentiana*, although I had one plant of it direct from CHENAULT labelled '*M. S. robusta*,' has the leaves on the young shoots tinted pink before they are fully developed. The leaves, moreover, although rather blunt at the point, do not recede.

The plant that I will call *M. S. robusta* has much stouter branches; it is a more vigorous plant; the young leaves have never the slightest tint of pink, and a large proportion of the leaves have a markedly receding end, i.e. if the leaf is stood on end on a flat surface, the end rests on two points and one can see under it between those points.

The flower buds on *M. S. robusta* are of quite a different shape from those on *M. Sargentiana*, being longer and somewhat hooked at the point. The flowers are very similar except that those on *M. S. robusta* are rather the more handsome of the two.

Another distinction can be made; *M. S. robusta* may flower quite young. At Bodnant a small grafted plant about 4 feet high, and another about 6 feet high, had this spring several flower buds upon them, while several plants of *Magnolia Sargentiana* itself, although quite large, have not flowered, except in one case where there were just two buds this spring.

The behaviour of these Magnolias to frost is perhaps interesting. There was a frost of 34 degrees (2 degrees below zero) registered on the night of January 26 of this year. This frost killed all the flower buds on *Magnolia Campbellii*, but left uninjured the buds of *Magnolias Sargentiana*, *Dawsoniana* and *mollicomata*. These latter buds started swelling in February in the normal way, but on the 2nd and 3rd of March there came two nights of frost of 10 degrees and 13 degrees respectively, which killed quite 80 per cent. of them; though all were not far from opening. Probably it was the less forward buds that escaped.

The buds of *Magnolia Sprengeri*, the white form, were uninjured by the big frost, but were nearly all killed by the March frost, while flower buds on a seedling from *Magnolia Sprengeri* var. *diva*, which seedling, however, may possibly have been a hybrid, were quite uninjured.

The buds of *M. salicifolia*, *Kobus*, *Veitchii*, *stellata* and *conspicua* all opened in due course without any injury.

FLORISTS' FLOWERS.—IV.

DAHLIAS.

By HARRY STREDWICK, V.M.H.

As far as can be ascertained the history of the Dahlia as a European flower dates from 1789, when flowers from seeds sent from a Botanic Garden in Mexico to the Abbé CAVANILLES, director of the Royal Gardens at Madrid, were seen for the first time. CAVANILLES gave his new flower the generic name Dahlia in honour of a Swedish botanist ANDRÉ DAHL, but DAHL does not appear to have been connected with the Dahlia in any way.

The first Dahlias grown in Spain were evidently by no means of a fixed type, for CAVANILLES decided there were three species *DD. pinnata*, *rosea*, and *coccinea*. Other botanists continued to discover new species, even different colours being regarded as species. The present-day Dahlia is a descendant of *D. rosea* and is now known as *Dahlia variabilis*.

The first Dahlias to be flowered in England were from seeds which the MARQUIS OF BUTE sent from Madrid to the MARCHIONESS. Mr. C. HARMAN PAYNE gives the date as 1789, but probably it was some years later. This stock was lost. In 1804 another lot of seeds was obtained at Madrid, and these were grown and flowered at Holland House, and in 1806 about 100 plants were flowering there. From 1804 onwards there are various references on record of Dahlias being grown by florists, and as early as 1809, one grower at least had produced a double variety. From then till 1820 a steady flow of new varieties, all doubles, are said to have been raised on the Continent. It is doubtful to what perfection this so-called doubling had attained, as one writer says that a flower with thirty florets can be said to be double. Also in form, the early doubles were not globular, but as far as I can find out, were probably flat, very much after the style of the old sorts 'Henry Patrick' and 'Cochineal.' It would be rather interesting to be able to follow the gradual development of the Dahlia from this point, till the perfect Double Show Dahlia was evolved. One thing is certain that raisers like the RAWLINGS BROS., who gave us such marvels of perfection as the old Shows, 'Arthur Rawlings,' 'R. T. Rawlings,' and 'William Rawlings,' have never been surpassed.

It may safely be said that up till 1880 the Dahlia was essentially a florist's flower, and its cultivation was carried on by fanciers, much as prize rabbits and guinea pigs are kept to-day, and Dahlia Shows were held as long ago as 1832 or earlier, whilst by 1870 interest in the flower warranted the institution of The National Dahlia Society.

The Dahlia, as already stated, originally came from Mexico, where it must have grown in a wild state, or at any rate a single form was wild, but in 1872 a grower on the Continent received from Mexico what was evidently not only a cultivated variety, but a highly developed one at that. This was named *D. Juarezii* after the President of Mexico, Juarez, and its resemblance to the blooms of the Cactus *Cereus speciosissimus* suggested the name 'Cactus Dahlia.' It is not clear whether 'Juarezii' was so named in Mexico or got its name in Europe. English growers are indebted to Mr. HENRY CANNELL of Swanley for introducing the Cactus Dahlia into England or rather for

distributing it, as Messrs. CANNELL obtained it from a private grower in London who had got plants from Holland.

The Cactus Dahlia was first exhibited in 1880.

'Juarezii,' as I remember it, was a full double flower, carried on a good stem, the petals being long, straight and narrow, but not, I believe, strikingly revolute. It also sported a purple variety which was named 'Beauty of Arundel.' It was generally supposed, at first, that 'Juarezii' would not seed, and for a few years so-called Cactus Dahlias comprised other types of more or less narrow-petalled sorts, but soon it was found that seed was obtainable from 'Juarezii' and Cactus Dahlias began to appear in ever increasing numbers, and the acme of perfection was narrow florets. I can in my mind's eye see, as it were, a Crystal Palace Dahlia Show, say in 1890 to 1900. Only four types were shown—Shows Dahlias, Cactus, Pompon and Single, and all but the Shows were exhibited in wire frames in bunches of 10, 6 or 3. Whatever may have been faulty about this method of showing blooms, it had much in its favour, as every flower was clearly seen when judging, and the entire exhibit was spick and span. Some of the stands of eighteen bunches of six flowers of Cactus Dahlias have, in my opinion, never been equalled as exhibits by any other method of staging, and the Pompons and Singles in neat bunches of ten were perfection. In addition to the classes for competition there were trade exhibits, and a greater variety of types were shown, which came under the heading of Decorative Dahlias.

The Cactus Dahlia soon became all the rage, and narrow petals were, as I have said, the one aim of raisers. Just at what time the cry arose that the Cactus had weak stems, it is hard to say, but gradually the Cactus fell into disrepute. I do not think the earlier Cactus were of bad habit. Here is the description of a novelty sent out in 1897: "It has a splendid habit, throwing every bloom 12 inches above the foliage."

The earlier Cactus had straight petals, but as time went on (I myself was one of the ringleaders) varieties were raised with incurved petals. They were by far the loveliest of all Dahlias, but Nature evidently designed them to hang face downwards. Over a space of many years I have found that incurved Cactus Dahlias will do any and everything sooner than carry their flowers on an erect hard stem; it has been a long struggle, now crowned with success, for to-day we have perfectly incurved true Cactus flowers carried erect on hard stems.

It may not be out of place to say a word about the raisers. At the end of last century the leading raisers were KEYNES, WILLIAMS & Co., of Salisbury, who with Mr. J. T. WEST of Brentwood were the earliest raisers of Cactus; Messrs J. CHEAL & SON, Crawley, who not only raised Cactus but specialised in Singles as well; Messrs. J. BURRELL & Co., Cambridge, who were great Cactus growers; Mr. CHAS. TURNER, Slough, and Mr. M. V. SEALE, Sevenoaks. All these gentlemen I knew well except Mr. KEYNES, and I also knew Mr. RAWLINGS of Double Dahlia fame.

Quite early in the present century Cactus Dahlias had so far advanced that they were as perfectly formed of narrow petals as to nearly equal present-day varieties. But I must not linger too long over reminiscences. The Cactus Dahlia gradually waned, it was all right for the exhibitor and the enthusiast, but it failed as a Dahlia for all purposes and, rightly or wrongly, the mode of showing flowers on

wire frames was blamed. Moreover, first one grower and then another introduced a new type. These new types were in a certain sense common to all raisers, but had not been taken note of. Messrs. J. BURRELL & Co. introduced Miniature Decoratives, 'Nora Bell' and 'Our Annie,' types which led to a vast array of small-flowered Dahlias, now known as Charm, Miniature Decoratives and Miniature Cactus. To get away from ultra formal types a section known as Paeony-Flowered Dahlias arose. These were first, I believe, favoured in Holland. They had little to recommend them and have faded out. To try to resuscitate the Cactus an intermediate type was introduced in which a stout stem and erect free-flowering habit was aimed at, the blooms not being composed of narrow petals, but more compact, and, if I may use the term, stumpy. The improvement in the Cactus as a whole has, to some extent, made any definition between the two rather difficult, and the name Semi-Cactus will doubtless lapse, as all Cactus become more uniform in growth and stem.

To-day Dahlias, to give a sort of genealogical tree, are divided into four sections: Dwarf Singles, taller Singles and Collarettes, then small Semi-Double, known as Charm Dahlias and large Semi-Double or Paeony-Flowered.

Similarly, starting with Cactus we have Single Cactus or Star Dahlias, Small Semi-Double Cactus, fully Double Semi-Cactus and finally the Queen of Dahlias, the large true Cactus. In other types we start with the Pompons, then come Miniature Decorative, Medium Decorative, Double Show Dahlias and finally the Giants.

The coming of Giant Decoratives placed the Dahlia on a higher plane than any type so far evolved, and as by far the majority of the really large varieties raised in England have been raised by J. STREDWICK & SON, I think I may be allowed to write on a personal note as regards 'Giants.'

The Cactus Dahlia, although very lovely, was, I realized, too fragile, and I tried crossing it with the Double Show. The result was peculiar. A strong-stemmed stubby-petalled compact flower, with a huge hard centre of unopened florets. We named four—'Erecta,' 'Lightship,' 'The Lion' and one other, but they were soon discarded. At that time, in all beds of Cactus seedlings a good number of large "coarse" flowers came every year, and were thrown away. An American grower who came to see me was astounded when I told him I discarded such flowers, and said in the States they would be worth big money. I started to grow the largest and flattest sorts, aiming to get away from the fragile Cactus petal. I was absolutely astonished at the flowers I got, and from that time till now I have yearly spent a lot of time and much care in raising Giants. So hidebound had growers become in regarding a narrow-petalled Cactus as the one and only worth-while flower to raise, that it is rather amusing to recall the comments which greeted me when I exhibited at Holland Park Show a stand composed largely of Giants. One said I ought to be ashamed of myself. Another warned me I should ruin my strain. Yet another said, "Why you have gone back to the beginning." A high official of the R.H.S. remarked (jokingly), "You ought to have six months hard." But the Giants came to stay, and I claim for them that they are at the top of the tree to-day, not only amongst Dahlias but any other flower. They exceed the largest Chrysanthemum in size. They are so easy to grow that the merest tyro cannot fail to produce satisfactory blooms.

It may surprise some people when I state that roughly the per-

centage of the various types of Dahlias sold by one firm in 1944 was Large Decorative and Medium 60 per cent., Cactus 25 per cent., Miniature 6 per cent., Pompons 6 per cent., Collarettes and Doubles 3 per cent.

And what of the Dahlia to-day? Surely no other flower can vie with it for popularity, and no wonder, for Dahlias are so adaptable as to be suitable for almost any purpose. They are of brilliant self colours, delicate soft colours, and every possible blending of colours, blue excepted. They flower continually from July till mid-October. They give an abundant return for very little labour. They are second to none as a subject to grace the average small garden. Coming to the larger types, these are the florist's flower *par excellence*, and many thousands of enthusiasts find rest and recreation and make a hobby of producing perfect specimens, rather than a number of blooms merely for decoration.

What a mistaken idea it is that the 'Giants' are of no use for cutting. Hundreds of times it has been dinned into me that "Oh yes, they are very wonderful, but no use for cutting." All through the autumn, anyone visiting Silverhill Park will see in vases, perhaps only one huge flower, or perhaps three. "How lovely," they exclaim. Yes "lovely" not "imposing," each a bouquet in itself. I do not belittle the smaller types for cutting, they too are lovely, but they have not a monopoly. Speaking of to-day, there is one aspect which is a little disquieting. All the different types have become so intermingled that to try to make any clean-cut division would be hopeless, but it would be quite easy to start with a single type, and in an unbroken sequence of forms culminate in the largest Giants. This is a matter of little consequence to the average grower, but when it comes to competitions it is wellnigh impossible to judge Dahlias fairly.

I will give a few measurements of Dahlias, blooms, etc.: our tallest plant was 9 feet 1 inch; it was a first year seedling, and had a fair flower. The shortest to top of bloom was 1 foot 1½ inch—a double-flowered variety. The largest leaf was 2 feet 3 inches long and 2 feet wide, i.e. a cut leaf; it was from the new variety 'H.M. Queen Elizabeth,' which also had the largest flower, 14½ inches across and solid. The widest petal was 3½ inches, a huge single. The narrowest, barely one-eighth of an inch—the Cactus, 'Mrs. Bregazzi.' The smallest flowers were a seedling Pom, about the size of a cherry. I do not know which flower had most petals, but a Large Decorative had 234, which I thought quite enough, and a plant of 'Plentiful,' a new Miniature, had 120 blooms out at one time.

Just a word or two as regards what the future may see in the way of fresh types. Practically every year one or more seedlings break away from any known type, and with patience could probably be fixed. There is, as a rule, one serious fault in these "breaks," and that is they are either weakly or prone to disease; also, by a busy man, they are apt to get left out of the running in the coming year. Of course, another difficulty is that with only one plant (or sort) there is only one way in which to perpetuate the species and that is by crossing with a known type, and trusting that some progeny will come true to the new "break." I have at the moment what I call an Aster-Flowered Dahlia, but I do not know if it will ever prove worth sending out; it has a perfectly quilled petal. Very often too, quite definite new forms come as seedlings, but gradually revert to an old type the second year.

CULTURE.

The Dahlia will succeed in any reasonable soil—sandy, light, loamy or heavy, and in any reasonable situation open or shady. To sandy soil, heavy manure can be added, and, speaking generally, the Dahlia delights in good living, but on heavy retentive land I prefer to concentrate on getting the soil worked into a friable condition to a good depth rather than depend on manure. Dahlias can be grown from seed and dwarf singles and singles may pay for the labour expended, but for all other types, named sorts are greatly to be preferred.

When plants have been obtained from a nursery, and grown for one season, they will by autumn have made a clump of tubers in the ground. These tubers, if lifted, dried, and kept from frost during winter, can, the second year, be bedded in a light compost in February and allowed to grow shoots four inches long. If these are cut off close to the base, and inserted in 3-inch pots in a compost of half coarse sand and loam, they will root readily in an ordinary heated greenhouse if stood on ashes in a not too sunny place and not near to the dry heat from the pipes. When rooted, pot into larger pots and plant out in May.

Old tubers can be divided, and the portions potted, each having an eye. Grow till nice plants and plant out, or the tubers can be planted, as entire clumps or divided, direct in the open ground.

The four main points when growing Dahlias are—manure, dig, stake, tie.

The manure may be broadcast, put in rows 2 feet wide, or dug in, where each plant is to be planted.

Dig roughly in autumn, and again at the end of April, and work and till in early May. Plant out on May 16, or soon after. At St. Leonards we say, "No Dahlia is any use planted in June."

Put a stake to each plant at once and tie loosely. In June put two more stakes. In early July remove the central bud of all Cactus and Giants, and a joint or two as well. Put string round the three stakes and tie each main side-shoot. Continue this as needed. Dahlias delight in a straw litter all over the ground, or failing straw any similar litter or leaf mould, especially in dry summers.

As for the remainder of the year, in the case of Singles, Poms, Miniature and Medium Decoratives, and Semi-Cactus, the plants need little disbudding or thinning. The Cactus and Giants can, of course, be thinned and disbudded to any extent, even to the extreme of one bloom per plant, but I do not advocate it. For the rest, it may be said that very few Dahlias are ruined by over-attention as regards watering with liquid manure in dry weather, and so on.

One last word—a great many Dahlias are spoilt at the start by slugs eating the rind in a ring round the stem of the young plants. Always dust with quicklime, round and on the stem two or three times, or until the stem has hardened. We have never found earwigs at all partial to Dahlias; now and then one or two appear, but not more than on other flowers. During the heat of June and July (if any) syringing with nicotine insecticide will ensure freedom from all pests, and with the addition of Bordeaux Mixture from disease as well.

(Illustrations Figs. 52-54)

OUR LAWNS AND THEIR RECONSTRUCTION.

By R. B. DAWSON, M.Sc., F.L.S.

Director, St. Ives Research Station, Bingley, Yorkshire.

(Lecture given on March 20, 1945 ; Professor F. E. Weiss in the Chair.)

I AM pleased to have this opportunity of discussing the subject of our lawns and their reconstruction. A great deal has happened since I gave my previous paper on the more scientific aspects of lawn management in 1938, but the end of the war is coming into sight, the dark days are passing, and we are now surely justified in thinking ahead and planning for the future of our turf.

What is primarily required is *practical* advice in order to help to re-make neglected or destroyed lawns, or to put back to grass those swards that have been dug up and used for food growing. I look upon the present time as a golden opportunity to effect major improvements to the lawn and to put right those things that we may have wanted to do in the past but could not bring ourselves to carry out, and I shall bear in mind very largely the needs of the amateur gardener.

There is no doubt that a good lawn determines the character of a garden and can make or mar the general landscape architecture. Unfortunately many amateur gardeners, and perhaps some professionals too, expect the lawn to look after itself, except for occasional rolling and mowing ; they fail to realize that the creation of good turf requires regular work and as much care as any other collection of plants growing in association, for indeed that is what a lawn is—an association of plants competing for space, yet continually mown and often trampled upon. If the balance is upset, low growing plants, other than grass, may make their appearance and compete on better terms than the grass.

Let us examine first of all some of the causes of past failures ; they may be summarized as follows :

1. Cheap or hasty preparation of the site.
2. Insufficient or incorrect preparation of the soil for the reception of the grasses.
3. The sowing of (a) impure seed, or (b) seed of low growth, or (c) seed of the wrong species.
4. Uneven sowing.
5. (When using turf) choice of bad turf and laying it unevenly.

When a lawn has been established deterioration sometimes sets in and the causes of such decline are as follows :

1. Abuse of the roller.
2. Use of an old or ill-set mower.
3. Wrong manuring.
4. Heavy wear and tear.
5. General neglect.

What is the ideal lawn ? What do we expect to find and what should be our ultimate goal ? First of all we must try to obtain uniformity in colour and texture. The surface must be true, for even if the lawn is purely for ornamental purposes a true surface is required ; without this the mowing cannot be even and mowing largely determines uniformity, density, texture, and colour. Then again we must aim to have a weed-free turf. We must also have grasses present that will

blend and not appear in irregular patches. Furthermore, no lawn can be uniform and neatly mown if infested with earthworms. Freedom from soil pests and fungal diseases are further ideals. The lawn should not only look well and feel resilient to the foot, but it should blend into its surroundings. Also, we should try to achieve some degree of drought resistance and a capacity to retain a reasonable condition during the winter months. The ideal is indeed exacting. The conditions required are so definite, however, that the botanical species suited to a lawn are very much restricted. Indeed the conditions, imposed mainly by the mower, often decide the grass and weed species capable of growing in turf.

Let us now proceed to some thoughts on the practical aspect of restoring lawns that have been neglected, or used for food growing during the war. Take first of all the case of the lawn that has been dug up and used for crop production, perhaps for three or four seasons. I think the best advice I can give is to aim for autumn sowing. A good way of doing this is to grow a crop of early Potatoes, which should of course be manured with compost or farmyard manure, well cultivated, and dressed with a suitable Potato manure containing phosphate, potash and nitrogen. If this is not practicable, other early crops, e.g. salads, early Carrots, and perhaps early Peas, could be grown, the aim being to have everything clear by about the middle of August. In other words, main crops which would carry on into September and the autumn and early winter should not be planted. This I consider from all points of view—food production and preparation—the best plan and it is preferable to a bare fallow. Another method, however, is to dig the site, roughly to prepare the surface in spring, then to sow White Mustard or Rape or Italian Rye grass and when these crops are 3 or 4 inches high to roll them down and dig in, then following the land and generally preparing it as will be described later, in readiness for the autumn sowing. The chief advantage, as I see it, for the planting of an early Potato crop is that it provides an opportunity for thorough cultivation and cleaning, and also an opportunity of treating the land generously with phosphate, potash, and nitrogen, of which the residue will be of assistance in establishing the new sward. I stress this point because under present regulations neither phosphatic nor potassic manures may be used for lawn treatment, but I can see little objection to the manurial residues being utilized for this purpose. Although the embargo on the use of all other fertilizers for lawn purposes, as well as sports grounds, has been lifted, it must be realized that all fertilizers are scarce and are primarily needed for food crops. Much can, however, be done on small lawns with various by-products and small amounts of non-controlled fertilizers.

In re-making a lawn it must be realized that the turf will probably be down for many years, therefore this is a unique opportunity to improve the soil in all ways possible prior to the establishment of the new turf. Thorough cultivation is a first necessity, and in the case of heavy soils further improvement should be made by incorporating coke breeze, coarse sand, well rotted organic manure, granulated peat, and materials of this type, to provide a friable soil approximating as far as practicable to a medium loam. In the case of very light soil, organic manures will help, as well as peat and similar moisture-retaining materials.

There are two ways in which the lawn may be established, either by seeding, or by turfing, and later we shall proceed to describe methods

to be adopted in each case, but assuming the site is to be cropped for the early part of the season, the aim should be to sow the seed about the last week of August or in the South the first week in September. In the case of turfing, the work can be carried out in the winter, preferably finishing it by December before the winter frosts commence in earnest. A turfing scheme gives a longer cropping period but does not solve the problem of finding good turf.

We have been considering so far the lawn site that has been growing food ; there are, however, many lawns that have not been cultivated but have deteriorated very seriously. In some cases the turf has been completely abandoned, possibly because the owners have been away. Spring is the right time of the year to start work in these cases. Perhaps one of the best ways is to try to burn off as much of the old matted grass as possible. Alternatively, or after the burning, rough mowing should follow. For this purpose the small lawn owner will doubtless use the shears, but it is very tough going. On larger areas scything or reaping will be best, followed by the side wheel mower. Dead and partially dead, matted grass should be raked off and indeed the whole surface would benefit by raking with a wire rake. Some rolling will then be necessary and it is a good opportunity to apply a dressing of sand or fine breeze to the surface which has no doubt become uneven through the action of earthworms and possibly moles and other pests. In the case of lawns that have been abandoned the probability is that many of the lawn weeds, so common to regularly mown turf, will have been smothered out. It is unusual to find weeds like Daisy, Mouse-ear Chickweed, Selfheal and Pearlwort under these conditions. At the same time stronger growing seeds like Dandelions, Thistles, and the taller growing grasses like Cocksfoot and Holcus may have become aggressive. Large tufts of Cocksfoot are difficult to deal with, but they should be hacked off close to the ground and it will be found that they die out by degrees under the influence of the mower. In the case of patches of Holcus of which two species, Yorkshire Fog and Creeping Soft Grass, may be involved, raking and re-seeding will be required, but if these grasses dominate the sward there is much to be said for complete reconstruction.

Then there are the lawns that have been mown occasionally but have received no dressing. They are probably looking very thin and poverty stricken and perhaps invaded by moss as well as many of the other lawn weeds like Daisy, Selfheal, Chickweed and so on. In these cases the owner has to decide whether he thinks it possible to resuscitate the turf by surface treatment or whether he will embark upon a major operation involving the digging in of the old turf and complete re-seeding. It is impossible for me to make a decision on this point without seeing the turf, but factors to bear in mind are the nature of the grasses present in the neglected turf and the general condition of the turf, and knowing what it was like prior to the war. If there is present a good stand of Bent grass or *Agrostis* in the turf, there should be no insuperable difficulty in encouraging it and gradually eliminating the weeds by surface treatment aided by hand work. If, however, there is a very large proportion of weed and a great deal of Yorkshire Fog and other coarse grasses and the land is very heavy, or very sandy, then a new start should be made. In these cases the best plan is to dig the lawn, turning the turf over and burying it ; bastard trenching is an advantage. In some cases lawns will have developed too high a degree of acidity during the war period ; this is especially likely to

be the case in the neighbourhood of industrial areas and large towns. Some degree of acidity of soil is desirable for fine turf, but if the pH of the soil is below say 5 to 5.5, light liming would be desirable. In some cases neglected lawns will be very matted with an accumulation of dead and semi-decayed fibrous material on the surface; in these cases vigorous raking with a wire rake should be done. Much of the weed control can be achieved by means of sulphate of ammonia and sulphate of iron, as will be described later.

So far I have endeavoured to indicate the general lines upon which neglected lawns should be dealt with and broadly how to restore a site which has been under cultivation for crops. Let us now go into the various operations in greater detail. The first thing in making a new lawn is to consider the question of drainage; if the land is heavy, or the site is inclined to lie wet, now is the time to introduce a system of drains, the form of which will of course depend largely upon the configuration of the land. On some very heavy soils the best results can only be obtained by removing a layer of top spit, introducing a bed of clinker and ash, and restoring the top spit to its correct position. Naturally this is a costly procedure and should only be attempted on very heavy land, but it is frequently done on bowling greens and quite often on tennis courts and some sports grounds where it is desired to play games as soon as possible after rainfall. As regards drainage, there are four main factors requiring consideration: the depth of the drains, their distance apart, the fall, and the outlets. For draining lawns a depth of 1 foot 6 inches to 2 feet is usual with a fall down to 2 feet to 2 feet 6 inches; a fall of 1 in 100 is usual but on larger areas 1 in 300 is effective. On medium soils the drains may be rather deeper and on sandy loams, if they require drainage at all, 3 feet to 4 feet is suitable. The distance apart of the drains is also determined by the nature of the land, they may be as close as 10 feet apart, but on a medium soil 25 feet, or on more open soils 30 to 50 feet. A herring-bone system of drainage is usually chosen but in all cases it is essential that a free outfall be provided, otherwise silting up soon takes place. On small areas in towns where a system of this type is impracticable, much could be done by a system of sumps filled with broken stones and with a few short drains radiating into them. After the tile drains are laid, broken stone, clinker and a layer of ash should follow. The soil should be 4 to 6 inches deep overlying the layer of ash.

The next matter is the choice of suitable seeds. Many lawn owners think of nothing but price, buying a cheap mixture which by very reason of its price is bound to contain perhaps 50 per cent. of perennial Rye Grass and, although the establishment may be good and the general effect at the start encouraging, the ultimate results will be most disappointing. It is therefore important that, having gone to a great deal of trouble to prepare the foundation of the lawn, a good seeds mixture be utilized. Experimental work has shown that it is possible to establish an excellent lawn from one species only or two species sown in combination. A very suitable mixture is:

7	parts by weight	Chewing's Fescue
3	" "	Browntop or Bent.

Both these seeds come from New Zealand and reasonable supplies are available. As a matter of passing interest about 15,000 acres of Fescue were harvested in New Zealand in 1943 and 10,000 acres of Browntop. In normal times a proportion of Creeping Red Fescue may be included in the above mixture but supplies at the moment are

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

FEBRUARY 20, 1945.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Award of Merit.

To *Cypripedium* × 'John Pitts' ('Noble' × 'Great Mogul'), (votes 13 for, 0 against), from Sir William Cooke, Bart., Wyld Court, Hampstead Norris, Berks. See p. 184.

To *Cypripedium* × 'Denehurst' Wyld Court var. ('Dervish' × 'Lady Mona'), (votes 11 for, 1 against), from Sir William Cooke, Bart., Wyld Court, Hampstead Norris, Berks. See p. 183.

To *Cypripedium* × 'Alison Jensen' ('Gwendoline' × 'Grace Darling'), (votes 15 for, 1 against), from N. M. Jensen, Esq., Dukes Edge, Woldingham. See p. 183.

Other Exhibits.

Cypripedium 'Esmeralda' and C. 'Pootings' var. 'Ilex,' from H. P. Lawson, Esq., Lynbrook, Woking.

Cypripedium 'Radamar' ('Radina' × 'Amarah'), from Lord Aberconway, Bodnant, Tal-y-Cafn.

Cymbidium 'Ruskin' ('Ceres' × 'Pearl'), and C. 'Jungfrau,' from G. P. Harben, Esq., Colbury House, Calmore, Southampton.

Cypripedium 'Beauford' var. 'Invicta,' from Messrs. Stuart Low & Co., Jarvis Brook.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Daffodils in pots.

Lindley Medal.

To Mr. Alec Gray, Penpol, Devoran, Truro, for an exhibit of miniature Daffodils.

Other Exhibits.

A group of Daffodils from the open, shown by Mr. T. A. V. Wood, Tresillian House, Summercourt, Cornwall.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Lady BRODIE HENDERSON in the Chair, and seven other members present.

Awards Recommended :

Award of Merit.

To Carnation 'Peter Lord,' as a variety for exhibition and market (votes 7 for, 0 against), shown by Mr. S. L. Lord, The Gardens, Shenley Hospital, nr. St. Albans, Herts. See p. 183.

To Carnation 'Sterling,' as a market variety (votes 7 for, 0 against), shown by Mr. F. Hicks, Emberbrook Nurseries, Wokingham, Berks. See p. 183.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and eight other members present.

Award Recommended :

Award of Merit.

To *Rhododendron* × 'Bric-à-Brac' (*R. leucaspis* × *R. moupinense*), (votes 7 for, 0 against), from Major E. de Rothschild, Exbury, Southampton. See p. 184.

Other Exhibits.

Rhododendron moupinense 'Pink Form,' from Major E. de Rothschild.

MARCH 20, 1945.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

Variation in foliage of Sterculia.—Mr. Lankester now reported that the tree from which the leaves shown at the last meeting were collected had been raised from seed by him from a tree with normal foliage. Dr. Sansome said that plants of the same species had been raised showing similar remarkable variation at Manchester University by Prof. Drummond.

Cuscuta Seed desired.—Dr. Sansome asked that any seed of *Cuscuta* sp. available should be sent to him, as it was required for experimental purposes.

Variation in bristles on husks of Sweet Chestnut.—Mr. G. E. Young of Westhumble Place, Dorking, sent samples of husks of Sweet Chestnut collected near Dorking to illustrate the difference in rigidity of the spiny growths on Chestnut husks, and therefore ease of handling Sweet Chestnut fruits. He had found two or three trees with bristles so soft that the fruits could be handled without discomfort, whereas others growing near by were very prickly. There is evident variability in this as well as in the size and character of the nuts produced by different trees.

Double-berried Physalis Alkekengi.—Mr. John Parkin sent a "lantern" of *Physalis Alkekengi* containing two berries side by side, instead of the normal one, gathered in his garden at Blaithwaite, Wigton, Cumberland.

Uncommon Conifers.—Commander Gilliland of Brook Hall, Londonderry, sent examples of the two uncommon Conifers *Dacrydium cupressinum* (the New Zealand Rimu), with long drooping yellowish-green shoots with juvenile foliage, and *Athrotaxis cupressoides*, with long, shining, flexible branches, both in excellent condition, such as are likely to be produced only in a mild district.

Variation in Cosmos.—Mr. Percy Lankester of the Agricultural Society's Garden, Alipur, India, sent a long series of ray florets of *Cosmos* from plants raised there with which he is experimenting. They varied enormously, not only in colour but in size and form. Some were an inch wide, coarsely toothed at the tips, some were deeply cut into three narrow lobes. In colour there was much variety, and in the width of the zone of colour which occurs in some forms, varying from a quite narrow band to half the length of the ray, while in others the colour occurs in stripes, or the base of the ray is white, the outer part pink or red.

White form of Hyacinthus azureus.—Mr. W. P. Wood, 183 Stafford Road, Caterham, Surrey, showed a pan of a white-flowered seedling of *Hyacinthus azureus* under the name of 'Pat,' the first white-flowered plants of this species of which we have any record.

Branching Leeks.—Leeks with many shoots from the base, instead of the normal one, were sent from Sleaford.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRETT, V.M.H., in the Chair, and fifteen other members present.

Exhibits.

Apple 'Ashmead's Kernel,' from C. H. Middleton, Esq., 17 Prince's Avenue, Surbiton.

Apple 'Symes Seedling,' from Mr. G. W. Lee, Melbury Gardens, Dorchester.

Apple 'Sydling Pippin,' from P. H. Sherry, Esq., 25 Dukes Avenue, Dorchester.

Seedling Apple from Miss V. E. Deane, 113 Upper Selsdon Road, Sanderstead.

Seedling Apple from Major E. A. Mackay, Hilperton House, Hilperton, Wilts.

Collection of Salads from Messrs. Allwood Bros., Haywards Heath.



FIG. 52 TYPE OF MODERN GARDEN CACTUS DAHLIA

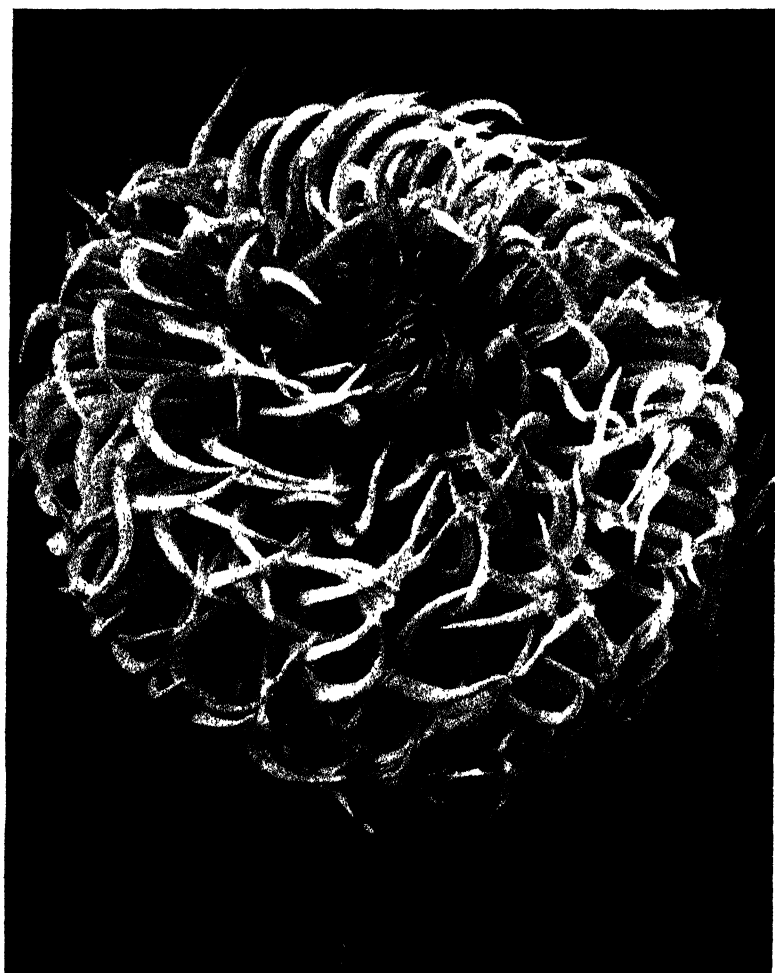


FIG. 53 A MODERN SHOW CACTUS DAHLIA 'LADY ALICE'

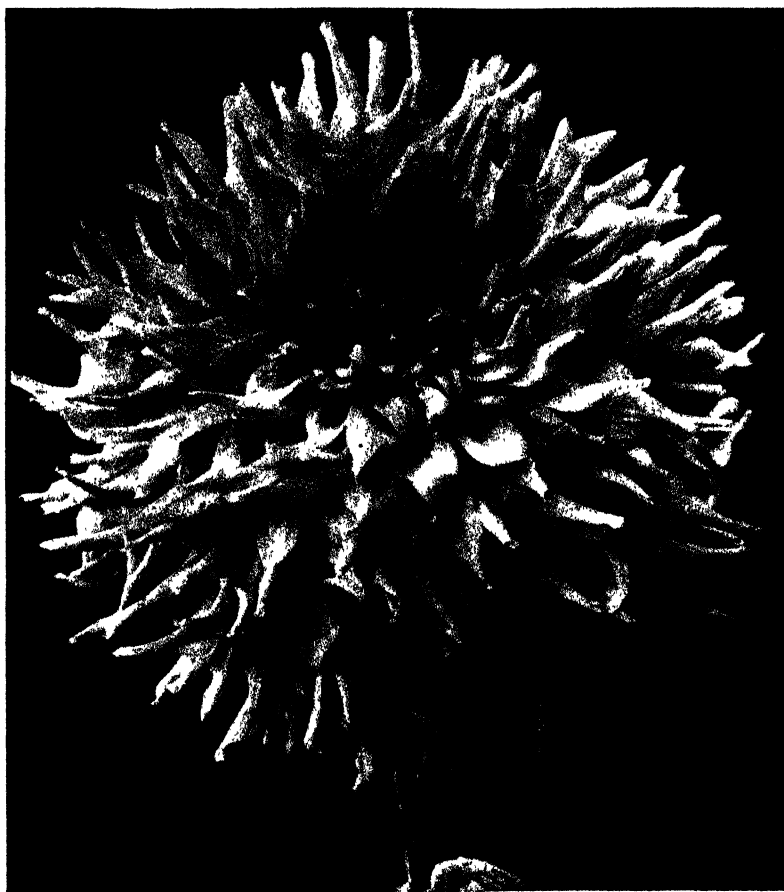


FIG. 54 LARGE DECORATIVE DAHLIA 'LORD LAMBOURNE,' AN
ADVANCED MODERN TYPE



Photo Major Pami.

FIG. 55 THE EXOTIC GARDEN AT MONACO
(See p. 176.)



Photo Major Pami.

FIG. 56 THE EXOTIC GARDEN AT MONACO
(See p 176)



Photo, Major Pam

FIG 57 THE EXOTIC GARDEN AT MONACO
(See p 170)

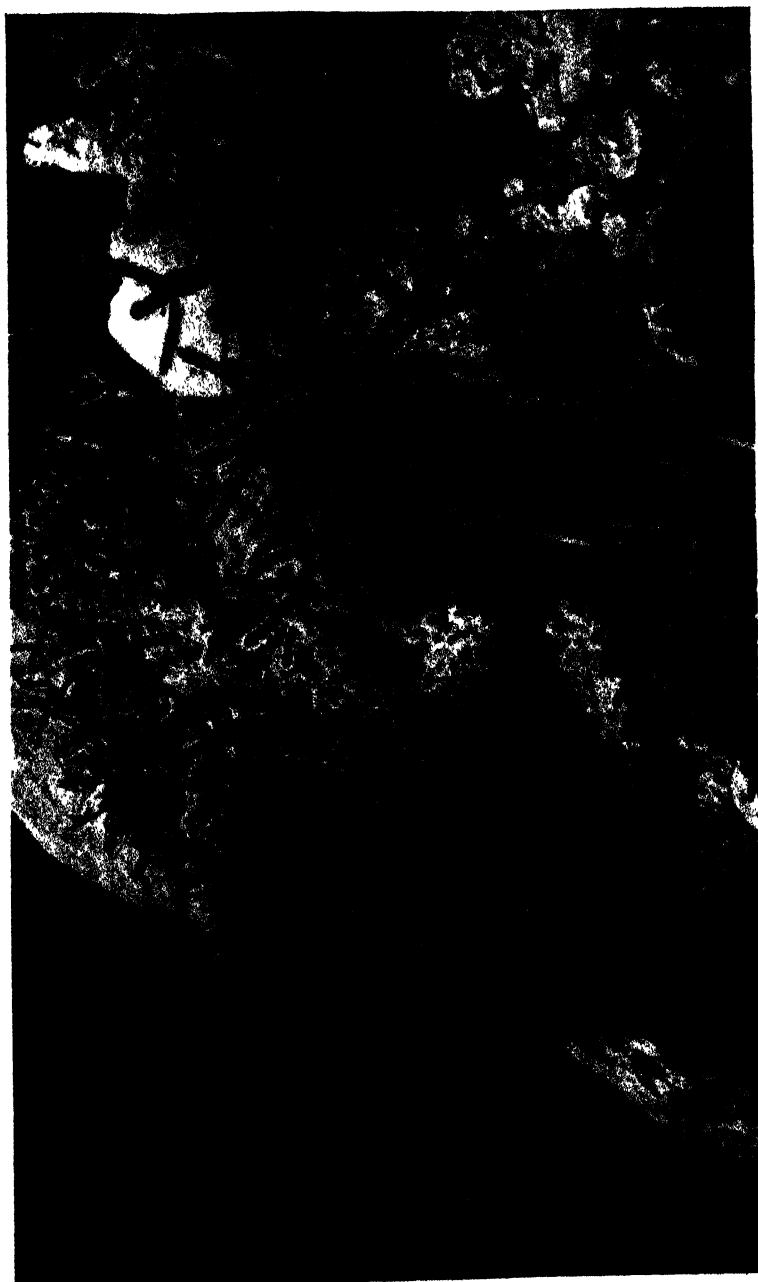


FIG. 58.—THE EXOTIC GARDEN AT MONACO
(See p. 176.)

Photo. Marco Pann



Photo Major Pam.]

FIG. 59. THE EXOTIC GARDEN AT MONACO
(See p. 176)

FLORAL COMMITTEE A.—Mr. D. INGAMILLS in the Chair, and ten other members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations.

Flora Medal.

To Messrs. C. Engelmann Ltd., Saffron Walden, for an exhibit of Carnations and *Strelitzia Reginae*.

To Mr. H. Stanton, Grittleton Gardens, Chippenham, for an exhibit of Cinerarias.

Banksian Medal.

To Messrs. W. A. Constable & Co., Tunbridge Wells, for an exhibit of Freesias.

Other Exhibits.

Blue Primroses and other Primulas from Messrs. Clarence Elliott Ltd., Stevenage.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering shrubs.

To Mr. E. Ladhams, Elstead, Surrey, for an exhibit of rock garden plants and flowering shrubs.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering and evergreen shrubs.

Award of Merit.

To *Primula Allionii* 'Apple Blossom' as a flowering plant for the alpine house (votes 10 for, 0 against), from Frank Barker, Esq., Onosma, Stevenage.

To *Primula marginata* 'Hyacinthia' as a flowering plant for the rock garden and alpine house (votes unanimous), from G. H. Berry, Esq., The Highlands, Enfield.

Preliminary Commendation.

To *Prunus* 'Okamé' (*P. incisa* × *P. campanulata*) as a hardy flowering tree (votes 10 for, 0 against), from Collingwood Ingram, Esq., Benenden.

Other Exhibits.

Hyacinthus azureus 'Pat,' exhibited by W. P. Wood, Esq., Caterham.

Picea × *Hurstii* (*P. alba* × *P. pungens*), exhibited by Sir George Campbell, Bt., Minard, Argyll.

Primulas and flowering shrubs, exhibited by Mr. M. P. Kooper, Ferndown.

Primula 'Margaret,' exhibited by Frank Barker, Esq., Stevenage, and G. H. Berry, Esq., Enfield.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:—

Silver Floral Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Awards of Merit.

To *Vanda coerulea* var. 'Bluebird' (votes 12 for, 0 against), from Messrs. Sanders, St. Albans. See p. 184.

To *Cymbidium* × 'Sunrise' var. 'F. K. Sander' ('Ceres' × 'Swallow') (votes 10 for, 1 against), from Messrs. Sanders, St. Albans. See p. 184.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. Barr & Sons, 13 King Street, Covent Garden, London, W.C. 2, for an exhibit of Daffodils.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

Silver Lindley Medal.

To Mr. Alec Gray, Penpol, Devoran, Truro, for an exhibit of Miniature Daffodils.

Silver Flora Medal.

To Messrs. R. Wallace & Co., The Old Gardens, Tunbridge Wells, for an exhibit of Daffodils.

Award of Merit.

To *Narcissus* 'Armada' as a variety for exhibition (votes 9 for, 0 against). Raised and shown by Mr. Guy L. Wilson, Broughshane, Co. Antrim.

To *Narcissus* 'Foresight' as a variety for exhibition (voting unanimous). Raised and shown by Mr. Guy L. Wilson.

To *Narcissus* 'Alamein' as a variety for exhibition (voting unanimous). Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Trousseau' as a variety for exhibition (voting unanimous). Raised by the late P. D. Williams, and shown by Mr. J. L. Richardson.

To *Narcissus* 'Krakatoa' as a variety for exhibition (voting unanimous). Raised and shown by Mr. J. L. Richardson.

Preliminary Commendation.

To *Narcissus* 'Ceylon' (voting unanimous). Raised and shown by Mr. J. L. Richardson.

Other Exhibits.

Narcissus 'Promptitude,' shown by Mr. Guy L. Wilson.

Narcissus 'Beirut' and *N.* 'Tramore,' shown by Mr. J. L. Richardson.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron siderophyllum*, from Major E. de Rothschild, Exbury, Southampton. See p. 184.

To *Rhododendron* 'Springtime' (*R. praevenum* × *arboreum* var. *album*), from Messrs. R. Gill & Son, Himalaya Nurseries, Penryn, Cornwall. See p. 184.

To *Rhododendron Geraldii*, from the Misses Godman, South Lodge, Horsham. See p. 184.

Other Exhibits.

Rhododendron calophytum, *R. c.* Exbury pink form, *R. c.* spotted form, *R. calophytum* × *lacteum*, *R.* 'Endeavour' (*arboreum album* × *lacteum*) and *R. scabrifolium*, from Major E. de Rothschild, Exbury.

Rhododendron grande, *R.* 'Irene,' *R. eximium*, *R. calophytum*, *R. argyrophyllum* and *R. coelicum*, from Messrs. Gill & Son, Cornwall.

Rhododendron calophytum, scented pink form, from the Misses Godman, Horsham.

Rhododendron 'Fiery Cross' (*barbatum* × ? *Griffithianum*) from W. Hutchinson, Esq., Finchampstead, Berks.

very scarce. On the lighter soils 5 per cent. of smooth-stalked Meadow Grass might also be included. The above seeds should be sown at $1\frac{1}{2}$ to 2 oz. per square yard, that is on the assumption that seed of high purity and growth is obtained. Chewing's Fescue has an unfortunate habit of losing its power of germination, either in transit or after reaching this country, and sometimes the seed is of low growth. A guarantee of growth should be obtained. Naturally only seed of high purity should be purchased and it should be borne in mind that, at a 2 oz. per square yard seed rate, even a small percentage of weed impurity by weight amounts to a large number of weed plants per square yard. Perhaps the following will make this clear. If a sample of Chewing's Fescue contains say 0.2 per cent. of perennial Rye Grass by weight as impurity and the Fescue is sown at 2 oz. per square yard, this will mean 50 potential Rye Grass plants per square yard. These would destroy the appearance and quality of the sward. This same weight of impurity as Chickweed, viz. 0.2 per cent., would entail planting 1,000 seeds of this pest. A seed sample quoted as 99.5 per cent. pure may be satisfactory if the remaining .5 per cent. is chaff but very dangerous if this balance is harmful weed. When sowing these two seeds together there is unfortunately a tendency for them to separate out because of the disparity in size. Also one tends in raking in the bigger seed to bury the finer too deeply. Quite a good method is to sow the Fescue separately. To do this $1\frac{1}{2}$ oz. per square yard of the Chewing's Fescue should be lightly raked into the surface with a wire rake. The Browntop or Bent seed should then be sown on top at $\frac{1}{2}$ oz. per square yard, mixed with some sand to aid distribution. This should be worked in by simply dragging a flattened dry sack over the surface. This works the small seeds into the crannies between the soil particles. The surface should then be lightly rolled, or gently patted with the back of a spade. We have sown many experimental plots in this way and found it to be very effective.

Chewing's Fescue is a wiry-leaved grass of which the colour is unfortunately not too good during the winter months and by reason of its toughness it tends to give trouble in mowing unless the machine has been very carefully sharpened and set. There is much to be said, therefore, for establishing a lawn of New Zealand Browntop only. In practice this has been done in many cases but results are often slow to come at the start. The seed of Browntop is very small—there are about 5 million to the pound; the seedling is therefore correspondingly small and so takes longer to establish. Chewing's Fescue, when sown with Browntop, has the advantage of acting as a nurse crop to the Browntop and from the lawn owner's point of view the soil is grassed over much more rapidly. Eventually, except on very light land, the Fescue is ousted by the more aggressive Browntop. For those who are able to prepare a good fine seed bed containing reserves of plant food, there is much to be said for the one-grass lawn, using New Zealand Browntop at $\frac{1}{2}$ oz. per square yard. In experienced hands as little as $\frac{1}{8}$ oz. per square yard may be utilized, since it should be realized that $\frac{1}{8}$ oz. of this variety contains about 40,000 seeds and potentially this number of plants per square yard. Establishment is often incomplete.

It may be argued that the above simple seeds mixture, or single sowing of grass is unsuitable to meet the wide range of soils likely to be encountered up and down the country. In practice, however, sowings of these seeds have been satisfactorily employed under a very wide range of soil conditions, but the view is expressed that it is preferable when sowing a lawn to modify the soil as much as possible so

as to try and make it suit the seeds mixture. At the moment there is very little choice in the matter of seed, as none of the European grasses, like Hard Fescue, Fine Leaved Fescue, and rough-stalked Meadow Grass, are available. I have already mentioned Rye Grass seeds mixtures and only on large areas like sports grounds, or where conditions of cost preclude the non-Rye Grass mixture, should they be used. A Rye Grass mixture is very useful for a lawn that is required as a playground or as a drying lawn but is not satisfactory for producing the best type of ornamental sward. Where Rye Grass mixtures are used, a proportion of the seed should be in the form of an indigenous or a leafy strain which is of more permanent value than the ordinary types of Rye Grass. Some non-Rye Grass mixtures, consisting basically of Cheiving's Fescue and Browntop, have in them also 5 per cent. or 10 per cent. of Crested Dogtail ; this grass does not blend with Fescue and Browntop.

Under extreme conditions of soil certain modifications of seeds mixtures may be desirable but we are much restricted at the moment in view of the absence of certain species from the market. On very acid soils, for example, additional grasses would normally be included. Establishment of grass under trees usually presents difficulties and here the inclusion of Rye Grass and Crested Dogtail with the seeds mixture already given is an advantage.

The fine seeds referred to must be sown uniformly and the seed is best divided into several lots and the ground covered an equal number of times. Seeding should always be done on a dry surface and the seed carefully worked into the soil. On larger areas some mechanical method of seeding will be required, either a small distributor, or fiddle seeder. Given good germinating weather the seedlings should be through in from five to ten days and if the soil has been well cultivated and is in good heart the grass will grow rapidly and soon require topping with the mower. The first cut is best done when the grass has reached a height of two inches and approximately half-an-inch should be removed. There is no advantage in leaving the grass until it is longer and much harm is frequently done by this unfortunate practice. Some articles on lawns recommend that the seedlings be scythed at this stage, but I have yet to find the amateur gardener who is capable of carrying this out. It is best to use a well-sharpened, side-wheel mower.

Even though great care may have been taken in preparing a seed bed and in buying clean seed, it may happen that a number of annual weeds will appear in the turf. Weeds like garden Chickweed and Groundsel sometimes occur, but it will be found that these gradually die out as a result of regular mowing ; they are not normal lawn weeds and are incapable of withstanding regular clipping. It is much more important at this stage that the lawn owner should concern himself with the removal of stray plants of other grasses like perennial Rye Grass, Cocksfoot, or Yorkshire Fog, that might have been introduced in the seed or were more probably present in the soil in a dormant state.

After the lawn has been mown for the first time it is sometimes desirable to roll lightly, and at this stage also a top-dressing of finely screened compost, containing a proportion of sand and very fine peat, is an advantage. If the turf is pale or discoloured it may be due in part to the effects of the first cut, but if it does not show signs of recovery after a short time it may be due to nitrogen deficiency, and when this is the case a light top dressing with compost containing sulphate

of ammonia at $\frac{1}{4}$ oz. per square yard may be given, or the sulphate may be given in solution. Another material of use for this purpose is nitro-chalk which can readily be broadcast over the surface.

I have used above the words "top dressing," by which I mean all those types of dressings of a bulky nature which are relatively low in plant foods and I do not include artificial manures. The dressing is applied to the surface of new or old lawns; the primary benefit being the filling of small hollows and general improvement of the surface. This facilitates mowing and helps to build up a strong mat of fibre or turf on the surface. Careful top dressing is one of the most important features of modern lawn upkeep. Top dressing material can be varied; it may consist solely of sand applied in the autumn to the heavier types of soil, or it may, especially if given during the growing season, consist of finely prepared composts containing sand, fine peat, dried digested sewage and a proportion of soil. The soil is of course better sterilized, which introduces a big subject and one which we can hardly touch upon at the present time. The material should approximate in quality to a good potting soil. Top dressing of this type is also a very useful vehicle for the distribution of the more concentrated plant foods. Much damage can be done by attempts at distributing raw fertilizers, but if they are bulked with seven or eight times their weight of top dressing compost only very careless distribution is likely to cause damage to the turf.

As the young lawn develops more frequent mowing will be required, but in the case of a newly-sown lawn put down at the end of August, or early September, it may not require more than say three light mowings before the colder weather sets in and checks growth. The grass should not, however, be allowed to grow long during the winter but should occasionally be topped with the machine in open weather. There is no necessity to cut ornamental lawns so keenly as bowling greens or putting greens and a good measure is a width of about $\frac{1}{4}$ inch between the bottom of the sole plate and a line drawn between the front and back roller of the mower. Mowing is one of the most important factors in turf management, and it is keen and frequent mowing that very largely encourages weeds. The constant defoliation of the grass reduces its aggressiveness so much that it causes an opening of the sward which then allows weeds to come in. Such invading weeds are always those types which are able to spread and propagate themselves below the level of the bottom blade of the machine. The ideal for lawn maintenance is to mow frequently but not keenly—perhaps two or three times per week during the growing season. In this way the maximum production of shoots can be assured, with stronger root growth and maximum competition against weed invasion. The worst thing one can do in mowing is to let the turf grow long and then hack it all off together as a special Saturday afternoon job. Naturally in mowing the lawn care must be taken to ensure that the machine is carefully set and especially is this so with newly sown turf. Better results are obtained by cutting when the grass is dry, and in dewy weather this condition can be encouraged by "switching" off the dew some time prior to mowing.

On many lawns one finds bare places which on close examination are found to coincide with lumps and ridges. They have been skinned by the bottom blade of the mower coming into contact with them as the front roller passes down on the far side of the lump. This indicates that the lawn has been badly laid in the first place or has settled. This fault can be corrected by occasional rolling, by frequent top dressing

of hollows, and in severe cases by opening the turf on the affected part and setting it lower.

It may be as well at this point to say something about the making of lawns from turf. Much of what I have already said has been concerned with the establishment of new lawns from seed, and I think on the whole this method is to be preferred because in urban areas it is very difficult to obtain a satisfactory type of good turf for the establishment of a fine lawn. If, however, good turf can be obtained it should consist primarily of plants of Bent (*Agrostis*) with relatively little weed. Turf that has received some preliminary treatment *in situ* before lifting is to be preferred. Sods are often offered by builders consisting of irregular lumps of turf with the grass perhaps 3 to 4 inches long, these are not really satisfactory and are the cause of much future trouble. Good turf should be uniformly lifted, it should be 1 to 1½ inches thick and should be in pieces of 2 or 3 feet by 1 foot. If the turf has been badly lifted it should be boxed, that is, it should be inverted in a shallow tray and the excess soil pared off to give a uniform thickness. By doing this much trouble is avoided when re-laying, because the turf bed can be carefully raked into a level condition and the new turf laid on it with the minimum of packing. It is a wise plan to pre-treat the soil with fertilizer before laying turf, because this encourages rapid root development and the turves are soon fixed down. Experiments have shown that the thinner the turf, within reason, the more rapid the establishment. When the new turf has been laid a heavy dressing of sand should follow and this should be worked into the cracks and seams in the turf. Rolling with about a 2 cwt. roller should follow after rooting has commenced.

On the subject of rolling much could be said. The roller is often abused ; it is used in an endeavour to eliminate lumps by pressing them down to the level of the hollows and this leads to excessive compression and very rarely completes the work. Better results are obtained by rolling only occasionally and by top dressing the hollows to raise them to the level of the ridges. On most lawns it is sufficient to roll once or twice in the spring and later to depend upon the roller mower as the means of compression.

On lawns that have become hide-bound or over-compressed or excessively matted on the surface, as might be the case on a neglected lawn, great improvement can be brought about by spiking and forking. Spiking is usually carried out on larger areas by means of a spiked roller and on small areas by means of a board studded with nails, but these forms of pricking do not penetrate deeply enough. Machines capable of penetrating 3 to 4 inches without tearing are available and are more satisfactory. On small areas hand forking is practicable, though of course the work takes longer in proportion. Some will use the garden fork for this but there are specially designed forks for the purpose. A strong case can be made for the tubular fork in which the tines are shaped like apple corers and which removes cores of turf from the lawn. Many remarkable cases of improvement have been seen following the use of this fork on neglected turf. Not only does it relieve any hide-bound condition but it speedily results in new root development down the sides of the holes. Drought resistance is increased and furthermore tubular forking is more effective in aiding water penetration since, on a very matted lawn, rain may fall and get no further than the top half-inch. The holes made by the tubular fork gradually grow over and though present are inconspicuous.

Mention may here be made of various surface operations. There is a tendency among lawn owners to think only in terms of mowing, rolling, and perhaps fertilizer treatment, but there are many other things that require to be done. We have mentioned switching to remove dew prior to mowing; drag brushing is very effective for scattering worm casts and on larger areas a mat or chain harrow may be used. Top-dressing should be worked in in the same way. Raking to remove creeping weeds is useful and close shaving of weeds like Clover and Yarrow with a small scythe-like blade is very effective.

In parts of the country with low rainfall even the most drought-resistant lawn will become brown and bare in summer unless artificial watering can be carried out. The important thing to realize when watering is that wetting the surface, though it may have a cooling effect, does not materially help the plants; the water must reach the root system if it is to do good. In this connection spiking is helpful, but if the lawn has been tubular forked the previous winter it will be found that artificial water can penetrate more satisfactorily. The best results are obtained by thoroughly soaking the lawn and not by light sprinkling at frequent intervals.

Many neglected lawns, coming in the category of those that have been mown and perhaps rolled but not fertilized during the war years, will be infested with mat weeds such as Selfheal, Mouse-ear, Chickweed, Pearlwort, Clover or flat weeds like Daisy, Plantain, Catsear and Dandelion. A great many of these can gradually be eliminated by the careful use of sulphate of ammonia and sulphate of iron. A commonly used mixture is:

3 parts sulphate of ammonia
1 ,, calcined sulphate of iron
20 ,, carrier

used at 4 oz. per square yard on five or six occasions during the growing season when the surface is damp and there is prospect of a sunny day to follow. Weeds like Dandelions and Catsear will not all be eliminated. Greater destruction can be done by spot treating with a stronger mixture, consisting of:

3 parts sulphate of ammonia
2 ,, sulphate of iron
5 ,, sand

Supplementary hand weeding will also be required. It will be noted that the above treatments do not make any contribution of phosphate or potash to the soil. At the moment these materials are debarred for this purpose, but it is hoped in due course that the embargo will be lifted and lawns that are being regularly treated will undoubtedly respond to the use of phosphate and potash. In many cases lawns are moss ridden and if this is not due to excessive acidity, involving light liming, it will be found that the 3:1:20 mixture above gives excellent results, but better results will be obtained when the treatment can be supported by the use of phosphate and potash. Where weed control has been achieved dressings should be less frequent. Raking out of moss is sometimes advocated; where soft and mingled with grass, combing out may be successful but it may also cause much bareness, necessitating re-seeding and heavy supplies of good compost.

The question of manuring lawns is in part covered by the remarks above and although the embargo on fertilizers other than phosphate and potash is lifted, other materials are none too plentiful. Several

useful forms of organic by-products may be mentioned, for instance dried poultry manure, dried digested sewage, of which there are some varieties fortified with phosphate, and other organic by-products. It has been found by experiment that long continued use of many of these organic materials, including dried blood and hoof and horn meal, tends to cause invasion by weeds like Pearlwort and it has also been shown that these can be checked by the occasional use of sulphate of ammonia.

It will be found on lawns infected with earthworms that the 3 : 1 : 20 mixture, primarily used for weed control, has a considerable retarding effect upon earthworm activity, as demonstrated by the number of casts. This method can hardly be regarded as a means of eradication. It is a fact, however, that worm-free lawns will remain remarkably free of worms if so treated and conversely that a worm-free lawn will become heavily infested if treated with lime or lime containing materials or with heavy or regular applications of organic fertilizers.

Where it is necessary to eliminate earthworms from a lawn several methods may be suggested. At the moment there is no mowrah meal available and this was the basis of the common pre-war worm killers applied to the surface and watered in. Many people to-day are using lead arsenate, and our experiments at St. Ives have shown it to be on the whole very successful. It is used at 2 oz. per square yard and has the advantage of destroying the worms below the surface. Copper sulphate may also be used and the method here is to dissolve 1 lb. of the granular crystals in 50 gallons of water and to apply this to 50 to 60 square yards of turf, during mild muggy weather if possible; great care is needed, otherwise damage will result. This method has the advantage of being inexpensive but in careless hands damage results. Our experiments with permanganate of potash showed this to be as effective as mowrah meal when used at the rate of $\frac{1}{2}$ oz. in 1 gallon of water to 1 square yard, but unfortunately supplies of it are limited at the moment. Finally, there is perchloride of mercury which I think it better not to advise for the private lawn owner in view of its very poisonous nature.

Two other types of lawn trouble may here be mentioned. First, turf diseases and, secondly, soil pests. When establishing a turf from seed it is often found that, after the seeds have been through the ground for about a week or ten days, circular rusty-looking patches appear, just as though someone had scattered some poisonous material over the surface; these are due to a disease of seedlings known as *Cladochytrium*. It is best dealt with by watering with Cheshunt compound solution or with dilute sulphate of iron solution. Established lawns that are receiving excessive amounts of nitrogen are liable to be affected, especially in September, by a disease known as *Fusarium* patch; it is particularly liable to attack annual meadow grass and to occur quite suddenly in mild muggy weather or in sheltered places. Experiments have shown that it can be controlled with various mercury compounds and prevented by spraying with malachite green and Bordeaux mixture. Where this disease occurs the system of manuring should be examined with a view to reducing the amount of nitrogen used in the future.

Besides earthworms, other pests of turf may occur. First, there is the leather jacket, grub of the crane fly, which can be controlled by extracting it with an emulsion of Ortho-dichlorobenzene and Jeyes Fluid, or by killing it in the ground by means of lead arsenate. Cock-

chafer grubs, fever fly grubs, and dung beetle grubs are also best dealt with by means of lead arsenate.

At the beginning of my remarks I said that it was a golden opportunity to effect general improvements to the lawn and I would like briefly to summarize some of the points to bear in mind. First, to avoid the various faults that I have already stressed, secondly to try and ameliorate heavy land, or on very light land to endeavour to improve it with water-holding materials. On lawns that have been made up by construction or by the fill and draw method, see that adequate soil is provided, especially at the draw end of the area. Then attention to drainage should be considered and, since during the war the trees overhanging our gardens have probably got somewhat out of hand, judicious lopping round the lawn sides is helpful. Especially is this so in towns since rainwater dripping from them is usually charged with dilute acids. In reconstructing our lawns attention must be paid to banks to see that they have adequate soil and that they are well drawn out and run gradually into the level part. A steep bank is most difficult to keep regularly mown and, if facing south, soon succumbs in dry periods. Grass verges deserve more attention. They are usually too narrow. Try the experiment of a really broad verge of 2 feet minimum, or perhaps more, and notice how much the effect will be improved.

It will, I hope, be realized that a lawn requires work just as other parts of the garden and that one cannot expect a perfect ornamental lawn that is also a playground for the children and their friends. In these cases it is best, I think, to let the children have first place or else to provide them, if there is room, with a separate area for play purposes. A wide expanse of lawn blended into the garden, unspoiled by beds cut into it, will be most gratifying in all ways, but we cannot achieve a good lawn without some expense. A good deal of common sense is needed in managing the turf and applying many of the points that I have stressed. Each case requires to be taken on its own merits but I hope my generalized remarks will be of some practical use.

THE EXOTIC GARDEN OF MONACO.

By MAJOR A. PAM, F.L.S., V.M.H. and VERA HIGGINS, M.A.

To the west of the town of Monte Carlo, on the middle Corniche road and facing due south, is the Exotic Garden of the Prince of Monaco. This is sometimes called the "Hanging" Garden, which is an appropriate name, as it clings to the steep face of the cliff from which the paths and the beds have been hewn. Bridges have been built over clefts in the rock face, and these clefts have been used as homes for suitable plants.

The remarkable thing about this Exotic Garden is that it consists only of succulent plants in the widest sense of the word—Aloes and Yuccas, Beschonerias and Agaves, Cerei, Euphorbias, Dyckias, and every kind of Cactus, etc. etc. Here can be seen the most complete collection of such plants in Europe, brought together from every part of the temperate and tropical world; every plant appears to be as satisfied with its environment as if it were in its native home.

The garden has taken many years to build, equip and develop, as its inhabitants were often raised from seed. The size that some of

the plants have attained is remarkable and the Garden improves year by year, although many hundreds of small and medium-sized specimens have to be moved at regular intervals to provide more room for others. It is a mistake to believe that the root system of these "succulents" is small and that they can be accommodated in restricted pockets. They are in fact greedy feeders, and their roots go a long way in search of nourishment and need a deep position. The construction of such a Garden, terraced and cut out from the almost vertical rock face, is complicated; very deep and extensive pockets are necessary to house the larger plants. Such pockets are built up with large rocks and then filled with suitable soil. In the case of specially big specimens, it has been found that half a sheep buried near the bottom of the pocket has given excellent results. Beds had to be formed, wherever this was possible, on level ground, paths were cut out and in some cases built up from below, to allow visitors to examine the plants; seats were provided wherever there was room enough.

The area covered by the Exotic Garden is not great, but the length of the paths is quite considerable in the aggregate, twisting and turning, rising and falling, in accordance with the face of the cliff. On each side of the paths are beds or pockets in which batches of the same species have been planted, giving a very good show at flowering time. Pockets have also been made for succulents with a pendant habit, while others, such as *Cereus triangularis*, climb up the face of the rock and attach themselves to it. Some Euphorbias and other genera grow into branched trees, some have the appearance of Palms, while the Opuntias form impenetrable barriers. Any piece from almost any of the plants in this Garden will root and grow in a few weeks; any thinning which has to be carried out entails the immediate removal of the pieces detached.

A general and complete view of the Garden cannot be obtained except from an aeroplane, but the many vistas to the East and West are really wonderful. Some are illustrated in Figs. 55-59. Fig. 59 shows fine examples of columnar Cerei against the sky-line, contrasting with the hard-leaved rosettes of Agaves in the foreground. Shrubby Euphorbias, with small-growing Aloes at their feet, face a cliff that reveals an enchanting view of Monaco in the distance (Fig. 55). The taller-growing Tree Aloes are represented by magnificent specimens, of which a group is shown in Fig. 56 with the thorny wand-like stems of Fouquieria, leafless at this season, in the centre. Spherical Echinocacti (nearly all *E. Grusoni* of various sizes), crowned with flowers, evidently thrive in this stony setting (Fig. 57). Fig. 58 shows an interesting group of Opuntias of various types; on the extreme left is the Cholla, whose short joints become detached when the spines catch in anything; in front, a spineless, flat-jointed type, its pads studded with tufts of the little barbed glochids more formidable in their penetrating power than many spines, and behind, the cylindrical branching type, with clumps of smaller Opuntias whose spines appear white owing to the loose papery sheath that covers them.

The climate of Monte Carlo appears to suit these plants very well. In summer-time the heat of the sun is so great that one cannot touch a rock exposed to it. The warm weather continues until the end of November, but there are usually some heavy rains during the autumn. The months of December to March are mostly unsettled with very fine and warm intervals, but considerable steady rains

and overcast skies. In April the fine warm spells are longer : the summer begins in May and there are occasional heavy thunderstorms and flooding during the hot season.

There is one peculiar condition in that part of the French Riviera. However fine the day and however hot the sunshine, the evenings after sunset are always cooler, sometimes even cold. The plants growing in the Exotic Garden thus have very much the same " desert " conditions as exist in their native homes.

RULES GOVERNING TRIALS AT WISLEY.

PLANTS AND VEGETABLES.

IN order to ascertain the merits of new varieties and strains of plants and vegetables, trials are conducted at the Society's Gardens, Wisley. These trials are of two kinds, " permanent " and " invited."

1. *Permanent Trials*.—A permanent trial is one which is carried on from year to year, and in which any variety selected by the appropriate Committee is grown in the following year beside a collection of standard varieties maintained largely for purposes of comparison. At present there are permanent trials of Border Carnations and Pinks, Clematises, Early-flowering Chrysanthemums, Daffodils, Dahlias, Delphiniums, Gladioli, Irises, Lupins, Michaelmas Daisies, Montbretias and Rhododendrons.

2. *Invited Trials*.—An invited trial is one to which Fellows and the public are invited to send plants or seeds in an appointed year. Invited trials are usually of short duration and are repeated at intervals of a few years in accordance with a programme known as the Trials Calendar. This calendar is reviewed annually, and the Council reserves the right to delete projected trials, insert new ones, and alter the arrangements in any way which seems in the best interests of the Society.

3. *Plants for Permanent Trials*.—The exhibitor of a plant selected by the appropriate Committee for trial at Wisley will receive in due course from the Director of the Gardens a request that the requisite plants, bulbs or other material be sent to Wisley by a specified date accompanied by a duly completed entry form.

4. *Plants and Seeds for Invited Trials*.—Anyone desiring to send a variety or strain to an invited trial must obtain from the Director of the Gardens an entry form which must be completed and returned by a specified date. The entrant must certify on the form either

- (a) that the variety or strain has been raised or developed by him,
or
- (b) that the variety or strain was, or is about to be, introduced by him to British commerce.

The entrant must also supply sufficient particulars of the history of the variety or strain to substantiate his certificate, but such particulars will not be published by the Society without the sender's consent.

To provide a standard for comparison, varieties which have previously received an F.C.C. or an A.M. will, usually, be included in a trial, but no such variety can be accepted for trial unless the prospective sender certifies that what he proposes to send represents an improved or re-selected strain of the variety, and unless he, at the

same time, supplies sufficient particulars of the history of the strain to substantiate his certificate.

The entries for an invited trial will be examined by a Sub-Committee, who will decide what entries shall be accepted and what standard varieties shall be included for purposes of comparison. Each entrant will be notified by the Director of the Gardens of the Sub-Committee's decision in regard to his entry, and, if the decision is favourable, the entrant will be asked to send a specified quantity of plants, seeds, bulbs, or other material to Wisley by a stated date.

5. *The Judging of Trials*.—Each trial will be examined as often as may be necessary by a Sub-Committee of the appropriate Standing or Joint Committee, and the report on the trial will be transmitted through the Standing or Joint Committee concerned to the Council.

6. *The Labelling of Trials*.—Up to the time when a trial is judged the plants will as a rule be labelled with indicative numbers only, but after adjudication the labels will give the names of the plants and of their senders.

7. *The Naming of Plants for Trials*.—If, in the opinion of the examining Sub-Committee, a plant under trial is incorrectly named, the fact will be recorded in the report, and if such a plant is deemed worthy of an award, the award will be made subject to the plant being correctly named.

If two or more varieties or strains sent for trial under different names are found by the examining Sub-Committee to be identical, or to be so much alike as to be practically identical for horticultural purposes, the fact will be recorded in the report and any award made will be made to the plant under what the Sub-Committee considers to be the correct name.

8. *Awards*.—The awards available for plants grown in trials are, from the highest downwards :

First Class*Certificate,
Award of Merit,
Highly Commended,
Commended.

Awards are made to the plants and not to the senders or raisers.

9. *Publication of Awards*.—Immediately after the awards made after a trial have been confirmed by the Council particulars will be sent to the horticultural Press.

10. *Reports on Trials*.—The name, descriptions and other particulars of plants which receive awards after trial will be published in the Society's JOURNAL. A full typescript report on each trial, including particulars of plants to which no awards were made, may be obtained for a small fee from the Secretary of the Society.

11. *Exhibits of Plants which receive Awards after Trial*.—Whenever possible an example of a plant, flower, fruit or vegetable which has received an F.C.C. or an A.M. after trial at Wisley will be exhibited at the Society's next Fortnightly Show in London.

12. *Interpretation of Rules*.—On the interpretation of these Rules and on all other matters connected with the trials the decision of the Council will be final.

THE NAMING OF GARDEN PLANTS.

THE naming of Garden Plants is governed by a set of Rules drawn up by the International Committee on Horticultural Nomenclature, Rules based upon and consonant with the Rules of Botanical Nomenclature. The aim of the Rules is to ensure that every plant has a name which belongs to it and to it alone. Speaking generally, the valid name is that which was first applied to the plant, either by LINNAEUS in his *Species Plantarum* published in 1753, or by some subsequent author. The rules aim at stabilization of nomenclature, but as will be seen some changes are bound to be made owing to the increase of our knowledge of the relationships of plants (see p. 181). Unfortunately the strict application of the Rules and a narrow interpretation of some of them result in proposals for other changes which add nothing to knowledge and may be followed by confusion and certainly by inconvenience, annoyance and unnecessary work, not perhaps to botanists but to those other numerous people who have to use the names of some plants even more frequently.

In 1942 the Council of the Royal Horticultural Society set up a Committee* to consider how what appear to be unnecessary name changes could be avoided without detriment to research in taxonomy or into the history of our knowledge of plants. The changes the Committee was asked particularly to consider were: (1) those where the name of a garden-raised hybrid, named in accordance with the plan long followed with a "fancy" name, was subsequently unnecessarily re-named with a name of Latin form, as had recently occurred with some well-known garden plants, and (2) where names of well-known species of plants cultivated in gardens were changed because a prior name had been found.

The Committee met several times and considered means of preserving such names from change and drew up Rules with that object. These proposed Rules were circulated to eminent horticulturists and botanists in the different parts of the British Commonwealth of Nations and in the United States, and they have, with very slight modifications, met with general approval.

In order to make the proposed Rules binding upon those whose business it is to name plants they will need to be accepted by the International Committee on Horticultural Nomenclature and by the International Botanical Congress, but it may be a considerable time before these bodies meet, and since the proposed Rules concerning the naming of garden-raised hybrids involve little change in the actual method of naming from that already in vogue, the Council intends to adopt them for immediate use in all matters where the Royal Horticultural Society is concerned with such hybrids.

The proposed Rule (p. 183) for excluding from use certain names of species which would, by the strict application of the existing Rule of priority, render well-known and widely used names invalid, needs the simultaneous action of all botanists in all parts of the world and the Council will move for its adoption in due course.

* The Committee with its co-opted members consisted of Mr. J. B. STEVENSON (Chairman), Lord ABERCONWAY, Professor Sir WILLIAM WRIGHT SMITH, Drs. E. J. SALISBURY and H. V. TAYLOR, Messrs. F. R. S. BALFOUR, W. J. BEAN, E. A. BOWLES, F. J. CHITTENDEN, A. D. COTTON, COURTNEY PAGE and GURNEY WILSON.

PROPOSED RULES FOR THE NAMING OF HYBRIDS OF GARDEN ORIGIN.*

" 1. Hybrids raised in gardens between two or more species, the parents being known, are designated by a name consisting of three terms: the *first*, that of the genus to which the parents belong; the *second*, a formula consisting of the names of the parents in alphabetical order separated by the sign \times (the pollen parent may be distinguished by the sign σ , the seed parent by ϕ , these symbols being inserted after the name), or where it seems useful or necessary by a 'specific name' preceded by the sign \times , in substitution for the formula; the *third*, the name of the particular form of the hybrid being referred to.

- (a) The *first* term (the generic name) follows the Rules, so far as generic names are concerned, given in Art. 32 and 33 of the Rules of Botanical Nomenclature.
- (b) The *second* term, when a 'specific name' is substituted for the formula, should be a 'fancy' name, formed and validated by publication in the same way as that of a horticultural variety but without other description than that it is the substitute for a given formula. When a formula is used it is also validated by publication without a description. All plants raised between the two or more species represented by one formula or name carry the same second term.
- (c) The *third* term, denoting the particular form, is subject to the same rules as names of garden-raised varieties.

" 2. When the parentage of a garden-raised hybrid is unknown, the hybrid is designated by the generic name and that of the form or 'variety' preceded by the sign \times , the *second* term being omitted."

Notes.

1. The proposed rule for garden-raised hybrids of which the parentage is known calls for the universal use of a trinomial, as for all garden-raised varieties of species.

2. It calls for the use of a formula for the parentage as the *second term* and recommends that this should generally be the only form for that term, the substitution of a name for the formula being exceptional and only to be made when a given group of hybrids of the same specific parentage shows such characters in common as to warrant it."

3. When such substitution is warranted it calls for a "fancy" specific name instead of a Latin one. It calls for no description to validate the *second term* other than the statement of parentage, which carries certain implications but does not seek to define precisely the limits of the characters which the formula implies. It therefore avoids the need for a Latin description for the "hybrid species."

4. It must be emphasized that the *second term* belongs to a range of plants which may show great diversity of characters, for the characters of both parent species may sometimes vary between wide limits. The parent species will in few instances be genetically pure and, even when they are, disturbing factors may intervene, leading to variations among the offspring. Only when the same individual plants are used as parents is it to be expected that the hybrid offspring will vary within a narrow range and not always then.

* Adopted by the Council of the Royal Horticultural Society at its meeting of March 20, 1945, for immediate use.

5. The *third term* belongs to the particular form of the hybrid named and calls for a definite recognizable description, but being a "fancy" name, the description need not be in Latin. This term is inalienable from the plant or the group with characters varying from it within such narrow limits that they call for no modification of the description. Such hybrids will not usually come true from seed and can be increased true to type only by vegetative means.

Ignoring the possibility of sporting, the *third term* of the name will carry the same connotation of characters for the whole period of that hybrid's existence, even though the other terms, i.e. the generic and "specific" names be legitimately changed.

6. Both the *first* and *second terms* may be subject to change. The genus (or genera) may be split or combined, just as *Cattleya* and *Laelia*, *Rhododendron* and *Azalea*, have fared, and the various old genera now constituting *Prunus* or *Narcissus*. Much the same applies to the species, which will call for changes in the formula, and *with it a change in the substituted name* (i.e. the *second term*). There is always the possibility of error in the naming of the parents, which would also call for a change in the formula and the substituted name. To these vicissitudes the *third term*, to which the description alone applies, is not subject. It is inalienable, like the description, from the plant. Properly formed, according to the Rules at the outset, it would probably be the most stable name in the whole range of plant nomenclature.

7. These Rules cannot be made retrospective without involving very large numbers of name changes, but many older names may (no matter what their form) be regarded as belonging to the third term and equally inalienable and stable and, when slight variation arises in seedlings of the same specific parentage, they can be used without causing ambiguity by attaching a subvarietal name to them.

In practice the formula (and even the "specific name" which may be substituted for it) will frequently be omitted and we may well have therefore *Eucryphia* × 'Rostrevor' and *E.* × 'Rostrevor Triumph' as names within the Rules, instead of *Eucryphia* (*E. glutinosa* × *E. Billardieri*) 'Rostrevor' or the substitute name *E.* × *intermedia* 'Rostrevor.' This finds a vast number of sanctions in practice, for example in *Narcissus* and *Iris*. We rarely write *Narcissus* × *incomparabilis* 'Fortune' for instance, or *Iris* × *variegata* 'Flaming Sword.'

CHANGES IN BOTANICAL NAMES OF SPECIES.

Proposals made by botanists for changing the names of species arise from a variety of causes. The grounds for change may be taxonomic or nomenclatorial.

I. Among the taxonomic grounds are :

(1) Error in identification involving the use of a name which actually belongs to a distinct species. The discovery of the error may be long delayed and the erroneous name pass into current, perhaps universal, use. A recent example of correction is *Veronica Traversii* : the plant so called is found to be distinct from that to which the name was originally applied, and it is now *V. brachysiphon*. Such a change can hardly be opposed.

(2) Alteration of the estimate of the limits of a genus or other group, which new knowledge has rendered necessary, or the clearer definition of generic or specific limits. An example is *Kerria japonica*,

formerly put into *Corchorus* and *Rubus*. This also can scarcely be opposed. General acceptance among botanists is the best guide for adoption.

(3) Further examples of (2) and the closely related alteration in the evaluation of the grade of a plant, i.e. species, variety, etc., are afforded by the proposal to divide *Sequoia* into *Sequoiadendron* and *Sequoia*, *Veronica* into *Veronica* and *Hebe*, *Primula* into *Omphalogramma* and *Primula*, the combination of *Prunus*, *Amygdalus*, *Persica*, *Cerasus*, *Padus* and *Laurocerasus* into *Prunus*, the splitting of many species into new ones, the union of other species at one time regarded as distinct, the raising of varieties to specific rank as with *Magnolia Sprengeri*, and conversely the reduction of species to varieties as with many *Rhododendrons*. These proposed changes may often, for practical purposes, be disregarded, but possibly with equal frequency they appeal generally and lead to general use of the new name. The safest plan seems to be, to be in no hurry to adopt such proposals unless their adoption seems clearly needed, but to follow general usage.

II. Changes based on nomenclatorial grounds :

Apart from such changes as arise from correction of illegitimate forms of names, the substitution of valid names for *nomina nuda*, and so on, the chief grounds for proposals for changes of this nature arise from the application of the Rules relating to homonyms and synonyms, both involved in the principle of priority. Priority for names of species of flowering plants and ferns dates from 1753. The application of a bar for prior names to displace those in universal use for, say fifty years, is shown to be unlikely to prevent the alteration of names we have commonly used, for "universal use" is difficult to prove and, as with *Larix decidua* and *Magnolia heptapeta*, often impossible to apply with the effect desired by those who wish to retain the names they have themselves used. Probably no arbitrary rule other than the existing one would satisfy the majority of botanists, but in view of the inconvenience and confusion caused to those whose business it is to work with living plants and their products for pleasure or profit, plants around which a vast literature has often grown up under names now commonly, though possibly not universally current, a Rule permitting the exclusion of names the adoption of which would be likely to cause such confusion, and would not materially advance the science of botany and the arts in which such plants are used, might be acceptable. The placing upon record of such *nomina excludenda* would achieve all or most of the ends which the adoption of hitherto overlooked or ignored prior names would effect.

The number of names so affected would probably not be great but they would perhaps include, for instance, such names as the prior use of *nobilis* as an epithet for a different species of *Abies*, which now threatens the name *Abies nobilis* for the plant so long commonly known under that name ; the prior use of *Lilium japonicum* for *L. longiflorum*, which threatens not only *L. longiflorum* but the present *L. japonicum* as well ; *Fagus glutinosa*, which has led to the substitution of *Eucryphia glutinosa* for the well-known *E. pinatifolia* ; *Clematis trifoliata*, which has by some transformed *Akebia lobata* into *Akebia trifoliata* ; *Lassonia quinquepeta* and *L. heptapeta* of BUCHOZ for the changes in *Magnolia* ; *Primula Halleri* and *P. rubra* of GMELIN threatening *P. longiflora* and *P. hirsuta*.

There is provision in the existing Rules for the conservation of

threatened generic names and though some of those conserved, such as *Hosta* and *Limonium*, would please most of us in England better if their alternatives, *Funkia* and *Statice*, had been retained, on the whole the machinery for this purpose has worked well.

Perhaps a somewhat similar procedure could be devised to ensure as little disturbance as possible for specific epithets.

The adoption of the following proposed new Rule would affect the desired purpose and the Council of the Society intends to put it forward as a means of reducing the number of name changes which most horticulturists regard as unnecessary.

"Proposals for nomenclatorial changes, based solely upon grounds of priority, shall be submitted to a Committee appointed for the purpose by the International Botanical Congress, which shall have the duty of excluding from the application of the Rules such names as appear, after consideration of the reasons advanced for the proposed change, to be likely to cause confusion or general inconvenience in any industry in which the plant may be used. In particular, names which have long been generally overlooked or ignored, or which have been so incompletely or inaccurately defined as to cause doubt as to the plant to which they were originally applied, shall be so excluded, and the *Nomina excludenda* shall be published in the same way as *Nomina Generica conservanda*.

"The right of anyone concerned to challenge such proposed name changes shall remain for x years from the date of publication of the proposed changes."

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Carnation 'Peter Lord.' A.M. February 20, 1945, as a perpetual-flowering variety, for exhibition and market. Plant of compact, free flowering habit, producing a succession of flowers. Flower stems stiff and erect. Flowers 3 inches diameter, dull rich crimson, full centred, very strongly scented; margin of petals serrated. Calyx strong. Raised and shown by Mr. S. L. Lord, The Gardens, Shenley Hospital, nr. St. Albans, Herts. See p. xxix.

Carnation 'Sterling.' A.M. February 20, 1945, as a perpetual-flowering variety, for market. Plant vigorous, free flowering habit, producing a succession of flowers. Flower stems stiff and erect. Flowers $3\frac{1}{4}$ inches diameter, soft salmon-rose, closely resembling 'Laddie' in colour; margins of petals faintly cut. Calyx strong. Sport from 'Spitfire.' Shown by Mr. F. Hicks, Emberbrook Nurseries, Wokingham, Berks. See p. xxix.

Cymbidium \times 'Sunrise' var. 'F. K. Sander.' A.M. March 20, 1945. The spike bore seven well-formed flowers, of buff colour much suffused with dull crimson, the labellum white with a dark crimson blotch on the apical lobe; the parents were C. 'Ceres' and C. 'Swallow.' Raised and exhibited by Messrs. Sanders, St. Albans. See p. xxxi.

Cypripedium \times 'Allison Jensen.' A.M. February 20, 1945. This flower is of large size, and has a white dorsal sepal with a greenish base, the petals and labellum being greenish yellow. The result of crossing C. 'Gwendoline' with C. 'Grace Darling.' Exhibited by N. M. Jensen, Esq., Dukes Edge, Woldingham. See p. xxix.

Cypripedium × 'Denehurst,' Wyld Court var. A.M. February 20, 1945. The roundly formed flower has the dorsal sepal greenish yellow with a narrow white border, the petals and labellum bright honey-yellow. Raised and exhibited by Sir William Cooke, Bart., Wyld Court, Hampstead Norris, Berks, the parents being *C.* 'Dervish' and *C.* 'Lady Mona.' See p. xxix.

Cypripedium × 'John Pitts,' A.M. February 20, 1945. This is a richly coloured hybrid, the dorsal sepal being deep rose-purple profusely spotted with dark crimson-red, while the petals and labellum are mahogany colour. Raised and exhibited by Sir William Cooke, Bart., Wyld Court, Hampstead Norris, Berks, the parents being *C.* 'Noble' and *C.* 'Great Mogul.' See p. xxix.

Rhododendron 'Brle-à-Brac,' A.M. February 20, 1945. This hardy *Rhododendron* is a cross between *R. leucaspis* and *R. moupinense*, and was raised by the late Mr. Lionel de Rothschild; it is rather more compact in habit than *R. moupinense*. The flower is pure white with only the faintest markings on the upper petal, the corolla is about $2\frac{1}{2}$ inches across, rotate, and the stamens have dark anthers like those of *R. leucaspis*. The scale buds are brightly coloured and more or less persistent. Shown by Major Edmund de Rothschild, Exbury, Southampton. See p. xxx.

Rhododendron × Geraldii. A.M. March 20, 1945. This plant was formerly considered to be a variety of *R. suichuenense*, but it is almost certainly a natural hybrid with *R. praevenum*; it is distinguished by the deeper colour of the flowers (which are faintly mottled, *Amaranth* Rose H.C.C. 530/1) and by the striking purple blotch (H.C.C. 830); the flowers are $3\frac{1}{2}$ inches across. Exhibited by the Misses Godman, South Lodge, Horsham. See p. xxxii.

Rhododendron siderophyllum. A.M. March 20, 1945. A stray seedling growing with the batch of *R. scabrifolium* Rock No. 25443, this plant is not a hybrid, as was thought possible, but a distinct species of the *Triflorum* section, subseries *Yunnanense*. The leaves are smooth and thin, scaly on the back; the flowers are larger than those of *R. scabrifolium* and the crimson stamens a marked feature. The bud scales persist during flowering and the calyx is very small and hardly divided into lobes; the stamens are exserted and the anthers which are curved at right angles to the filaments are crimson, the colour persisting a third of the way down the filament. Exhibited by Major Edmund de Rothschild, Exbury, Southampton. See p. xxxii.

Rhododendron 'Springtime.' A.M. March 20, 1945. A hybrid between *R. praevenum* and *R. arboreum* var. *album*, this free flowering, hardy plant bears compact trusses of white flowers, shading to very pale greenish-yellow in the throat (H.C.C. 663/3); the corolla is without blotch or marking of any kind, though some flowers showed a faint blush pink on the outside; the width is $2\frac{1}{2}$ inches. Exhibited by Messrs. R. Gill & Son, Himalayan Nurseries, Penryn, Cornwall. See p. xxxii.

Vanda coerulea var. 'Bluebird,' A.M. March 20, 1945. The species was discovered by William Griffith in Upper Burma in 1837, and received a F.C.C. when exhibited by Veitch in 1870. The present example bore a spike of nine flowers and buds, the sepals and petals mauve-blue, the labellum rich violet-blue. Exhibited by Messrs. Sanders, St. Albans. See p. xxxi.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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THE SECRETARY'S PAGE.

Programme of Meetings.—The Meetings with Shows in July will be held on Tuesday, July 3 (12 noon to 5 P.M.), and Tuesday, July 24 (12 noon to 5 P.M.).

The following competitions will be held in conjunction with the above Shows :—

On July 3—for Lilies and for fruit grown in the open air.

On July 24—for Fruit and Vegetables, for Border Flowers (bulbous plants excluded) and for the Clay Cup for the best scented Rose. Particulars of these competitions can be obtained on application to the Secretary. The competition for Flower Arrangement for amateurs will be held on September 11, and that for professionals on October 2. There will be no Show in August.

Lectures.—The following lectures, in conjunction with the above Meetings, will be given at 2.30 P.M. in the Lecture Room of the New Hall, Greycoat Street.

On July 3—"Lilies," by Mr. R. Wallace.

On July 24—"Difficult Plants for the Enterprising Amateur," by Mr. D. Wilkie.

Demonstrations at Wisley.—The following demonstrations will be given at Wisley :—

Fruit Garden.

July 11, 12. Summer Pruning of Fruit Trees 2-4 P.M.

Fellows and Associates desiring to attend are requested to notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

How to get to Wisley.—Fellows and Associates desiring to travel to Wisley from London should take a train from Waterloo to Esher and there pick up the bus No. 215, which will stop on request at the turning for the Gardens on the Portsmouth Road. For the times of the bus No. 215, inquiries should be made at the London Passenger Transport Board, 55 Broadway, London, S.W. 1 (Tel. Abbey 1234), and for

particulars of the trains, the current time-table should be consulted or inquiries made at Waterloo Station (Tel. Waterloo 5100).

Kindred Societies.—On the occasion of the Show on July 3, there will be a competition for Delphiniums, held by the British Delphinium Society, a competition for Sweet Peas, organized by the National Sweet Pea Society and a competition for Border Carnations, held by the National Carnation and Picotee Society. The National Carnation and Picotee Society will also be holding a competition for Border Carnations in conjunction with the Show on July 24.

Tomato Spraying.—The attention of Fellows is drawn to the importance of spraying outdoor Tomatoes as a protection against Potato Blight disease which rapidly destroys Tomato fruits. For spraying one of the well-known copper-containing sprays now sold for the purpose is used. It should be applied when the plants have reached their required height and have been "stopped." At Wisley in a normal season one good spraying applied the first week in August has been sufficient, but in a wet season it may need to be repeated. In Wales and the West country two sprayings are probably necessary, and the first one would fall due much earlier in the season. We consider this spray treatment of the utmost importance for outdoor Tomatoes.

Colorado Beetle.—The Ministry of Agriculture and Fisheries asks that notice may be drawn to the danger of the Colorado Beetle establishing itself in this country. Under present conditions the need for vigilance is greater than ever and it is of the utmost importance that any specimens of the Beetle that may arrive in this country should be detected and dealt with before they have had time to multiply. The Ministry of Agriculture and Fisheries is accordingly anxious to obtain as early notification as possible of the discovery of the pest in this country.

Any yellowish beetle with black stripes, running up and down the beetle, not across, or any red or reddish-yellow grub that is found feeding upon potato leaves should be regarded with suspicion. When the grubs or beetles suspected of being Colorado Beetles are discovered, specimens should be placed in a tin box (in which no holes should be punched) with a piece of potato leaf and the box should be sent to the Ministry of Agriculture, Plant Pathology Laboratory, 28 Milton Road, Harpenden, Herts., with a letter stating the exact place where the insects were caught and the name and address of the finder. Nothing more should be done until instructions are received from the Ministry.

Subscriptions.—The Secretary desires to draw the attention of the Fellows and friends of the Society to the following bye-law:—

"A Fellow, if elected on or after the 1st of July and before the 1st of October, shall pay half a year's subscription."

Should a full subscription for the year be paid every endeavour would be made to supply the back numbers of the JOURNAL, although some of them are in short supply. Forms of application for Fellowship are obtainable from the Society's Office.

WISLEY IN JULY.

THE most interesting features of the Gardens at the present time are the herbaceous borders, the Rock garden, Lilies and some late-flowering shrubs in the Wild garden, Heathers in Seven Acres and

Roses on the hill. As at most seasons of the year there will be a variety of flowers in the Temperate and Half-hardy houses, and the collections of Gladioli and Border Carnations will be very colourful.

Of the large number of plants flowering in the herbaceous borders we may mention the earlier Heleniums, Phlox, Monardas and Rudbeckias as supplying masses of bright colour which contrast effectively with the grey-leaved Artemisias, pink and white Gypsophilas and the grey-blue, spiny *Eryngium planum*. *Achillea Eupatorium*, with long-lasting yellow heads, *Coreopsis grandiflora*, *Anthemis tinctoria* and the variable, rose-coloured forms of the common Yarrow, *Achillea Millefolium*, are other familiar plants of merit. Some good things less generally planted are *Verbena bonariensis*, with branched violet heads on strong, slender stems five or six feet high, *Lysimachia clethroides*, whose dense, white spikes are particularly attractive to butterflies, the rose-pink *Pentstemon campanulatus*, *Malva Alcea fastigiata*, tall, graceful and free-flowering, and *Acanthus spinosus*, with bold foliage supporting dense, sharp-bracted inflorescences.

Other herbaceous plants better suited to woodland conditions are to be found in the Wild garden. The tall, arching panicles of *Campanula lactiflora*, carrying innumerable pale blue bells, look well in association with *Primula Florindae* along the margins of ditches. *C. latifolia alba* is a stately, white-flowered variety ornamental for a short time. The Funkias are now producing lilac- or lavender-coloured flowers above bold clumps of heart-shaped leaves : they are, perhaps, most pleasing in early May, when their pale green or variegated foliage first unfolds. *Digitalis ambigua*, a buff-yellow Foxglove of modest stature, forms an attractive group, as does *Lysimachia quadrifolia*, a slender North American Loosestrife. *Tropaeolum speciosum*, sending tenuous growths in all directions, drapes the Azaleas with trails of scarlet blossoms. Lilies are prominent, and include the softly-coloured hybrid *L. testaceum*, *L. canadense* with smaller and more shapely flowers, and *L. pardalinum*, variable in its orange-red colouring and degree of spotting.

Of the few shrubs still to flower in this part of the Gardens the Chinese *Rhododendron auriculatum* is the most conspicuous, bearing lax trusses of large and fragrant, white blooms. *Magnolia virginiana*, the American 'Sweet Bay,' is the last of its genus to open here, but its sweet, creamy blossoms are insignificant by comparison with those of *M. grandiflora*, of which a fine group may be seen at the west side of the Iris trial ground. The hybrid *Eucryphia nymansensis* (*glutinosa* \times *cordifolia*), tall, free-flowering and more or less evergreen, is one of the most valuable of the later shrubs.

The Heath garden in Seven Acres is again colourful. The varieties of *Erica cinerea* are soon supplemented by the Dorset Heath, *E. ciliaris*, the Cornish *E. vagans* and the taller, pink-flowered *E. terminalis*, as well as the numerous forms, both single and double, of the common Ling ; and there are still plenty of purple and white spikes on the Irish Heath, *Daboecia cantabrica*. Waterlilies are still flowering in the large pond, and around the margins the blue Pickerel Weed, *Pontederia cordata*, and the pink Flowering Rush, *Butomus umbellatus*, look well together.

The Rock garden is still bright, Campanulas being well to the fore, and there will also be those reliable, floriferous Gentians, *G. septemfida* and *G. lagodechiana* ; and the equally notable *Cyananthus microphyllus*, opening a long succession of pale blue, Periwinkle-like flowers

on a mat of prostrate stems, *C. lobatus insignis* and *C. lobatus albus*, with larger blooms of purple and white. Some other plants of character are *Geum Borisii*, with large flowers of glowing Nasturtium-red, *Platycodon grandiflorum*, like a fine purple or pearly-white Campanula, the silvery-blue *Codonopsis ovata*, and *Stokesia cyanea*, whose flattish, lavender heads suggest a giant Centaurea. The small rock-pools contain some of the less rampant Waterlilies, such as the rosy-crimson 'James Brydon,' whose cup-shaped blooms are seen in perfection here.

In the Alpine house there are, as usual, some uncommon and interesting plants in flower. Here, as outside, Campanulas are prominent, and the collection includes the floriferous *C. rotarvatica*, *C. Waldsteiniana*, very dwarf and dense, with starry purple blossoms, *C. 'Highcroft China'*, whose wiry stalks carry large numbers of silvery-blue, nodding bells, and the pale blue *C. Tymonsii* of more trailing habit. The related *Diosphaera asperuloides* forms a flat cushion of minute shoots covered with China-blue florets. *Theropogon pallidus*, with grassy foliage and pink, Lily-of-the-Valley spikes, *Pelargonium Endlicherianum*, with quaint, rose-coloured flowers on tall peduncles, the small yellow *Viola saxatilis*, *Acantholimon venustum*, one of the best of this attractive, pink-flowered genus, and *Crepis incana*, a bright rosy member of a large family composed chiefly of yellow-headed weeds, are some of the other good things worth noting.

Of the many more or less tender plants at their best in the Temperate and Half-hardy houses it will suffice to mention as examples: *Solanum Wendlandii*, *Lonicera Hildebrandtiana*, *Plumbago capensis*, *Cassia corymbosa*, *Littonia modesta* and *Sphaeralcea Fendleri*.

In the Vegetable Trial ground the following crops may be seen: Early Peas, nearly all of well-known standard varieties such as 'Onward,' 'Gradus,' 'Progress' and 'Alderman'; also several varieties specially suitable for canning. Lettuce in a full range of varieties used in both private and market gardens; round-rooted summer Radishes and the popular round Beet are also well represented. The dwarf French Beans are all grown from seed produced in this country.

GARDEN WORK.

REMINDERS FOR JULY.

Vegetable Garden.—Routine work consists of the thinning of various crops, hoeing, and, if necessary, watering copiously such crops as Runner Beans, Celery and Vegetable Marrows. In order to obtain maximum results, attend to the timely gathering of Peas and Beans and, where portions of these crops have been reserved for seed purposes, careful watch should be maintained to protect them from birds and vermin.

Early in the month sow Turnips for storing, 'Green Top Stone' being a suitable variety for this purpose. About the same time sow Endives for early supplies, if required. To produce good quality heads of Cabbages for October and November cutting, seeds should be sown about the 10th of the month on ground recently cleared of early Peas or Broad Beans. Sow thinly in rows 18 inches apart and gradually thin out the seedlings to about 15 inches; *do not transplant*. Varieties usually grown for spring cutting, such as 'Ellam's Early,' 'Harbinger,' 'First and Best,' are suitable for this purpose. About the third week make a sowing of Spinach Beet for autumn and spring supplies, and in cold districts make a sowing of Cabbages for spring cutting.

In favoured localities successional sowings of stump-rooted Carrots and Globe Beetroot can be made early in the month for latest supplies. Continue to make successional sowings of Cabbage Lettuces, but cease sowing Cos varieties about the middle of the month.

A Strawberry bed cleared of worn-out plants, and ground which has produced early crops such as early Peas, Broad Beans or Potatoes, provide excellent sites for planting Broccoli, Kales and Savoy, etc., for late winter supplies. Plant Leeks as the seedlings become large enough and the ground available.

Continue to remove side shoots from Tomatoes; pinch out the top of the main stem from plants growing out of doors when four trusses have set.

During spells of dry weather Runner Beans are often shy at setting; if this is so, syringing the plants in the evening with water will assist the flowers to set; pinch out the growing points of the plants as soon as they reach the top of the supports.

When Shallots and Garlic have died down sufficiently lift the crop and expose the bulbs to the ripening influence of the sun. Herbs required for winter use should be cut just before they come into flower; tie them into small loose bunches and suspend in a warm, airy place (excluding direct sunlight) and dry thoroughly before storing.

Potato Blight, which kills Potato leaves and thus reduces the crop, and also causes the Potatoes to go bad either in the ground or during storage, can be reduced to a minimum by spraying with Burgundy or Bordeaux mixture. Apply early in the month and repeat in three weeks' time, if necessary. In the vicinity of industrial towns do not spray before seeking the advice of your county horticultural supervisor.

As a deterrent against Celery Leaf Miner apply a dressing of soot to the Celery plants every week or ten days until all danger of attack is over. Should a bad attack develop, spray with a nicotine soap wash. Spray Celery plants with Bordeaux mixture and repeat every three weeks as a preventive against Celery Leaf Rust.

Fruit Garden.—Where it is desired to carry out summer pruning on restricted forms of Apple and Pear trees, this operation can be carried out during the present month, the actual time depending upon local conditions. During an average season the growth of Pears is usually ready about the middle of the month, and Apples towards the end. Summer pruning of these trees consists of shortening the laterals to about five fully developed leaves, leaving the leader on each main branch unpruned. Spread the operation over a period of about a fortnight, dealing with the most forward shoots first, leaving those not so advanced until later.

Apples and Pears will now be through the "June drop" and final thinning of the fruits can be carried out, starting with early-maturing varieties; follow with the mid-season, and lastly the late varieties. Variety and vigour of the tree should have a bearing on the severity of the thinning, but a general guide is to space the fruits of dessert varieties at about 6 inches apart, and the larger cooking varieties at about 9 inches. Cooking varieties need not be thinned so drastically in the first instance, as the later thinnings, if left until the end of the month or early in August, can be used for cooking purposes. Naturally all diseased and maggoty fruits should be removed and burnt.

As soon as the last of the fruits are cleared from Strawberry plants the bed should be cleaned. Remove the straw and weeds, cutting off

any dead foliage and all runners not required for propagation. Lightly fork over the soil between the rows and apply a light mulch of farmyard manure or garden compost. Where it is intended to raise new plants the parent plants should be healthy and vigorous and possess a good fruiting record; do not propagate more than four or five runners from any one plant. Arrange the runners evenly round the plant and secure either direct into the surrounding soil or into small pots filled with a prepared compost. If necessary water the runners until they have become well rooted.

Continue to syringe Peach and Nectarine trees according to weather conditions, and carry out the same cultural operations as recommended for trees growing under glass. When the fruits are reaching the ripening stage it will be advisable to net the trees.

Flower Garden.—Wallflowers, Sweet Williams and other plants, sown in May and treated as biennials, should be planted out in nursery beds to produce good plants for placing in their flowering positions in the autumn.

Layer Border Carnations immediately the flowers have faded, and water on all necessary occasions until the layers are well rooted.

The present is a good time to bud Roses.

Cut the flowers of Sweet Peas regularly.

Remove faded flowers from plants growing in beds or borders to prevent seeding, thus extending the flowering season.

Water Violets in dry weather, occasionally dusting the plants with soot, which helps to keep Red Spider in check and encourages growth; remove all runners.

The majority of garden hedges, if cut towards the end of the month, will make sufficient young growths to mask the shear cuts and remain neat throughout the autumn and winter. The exceptions will require a further trimming towards the end of September.

If not already done, order bulbs for forcing or planting in the garden, including *Lilium candidum* for planting out next month.

Cold Greenhouses and Frames.—Early in the month sow seeds of Brompton Stocks for providing a display next season in the flower garden.

Continue to give the necessary attention to Tomato plants growing in unheated greenhouses or frames by the removal of side shoots, training and tying. Watering should be carefully attended to, and at this stage the plants would benefit by feeding at intervals with a well-balanced fertilizer.

Regulate the growth of Cucumbers growing in frames, and when the main laterals have almost reached the sides of the frames the growing points should be pinched. The resultant sub-laterals should be pinched at two leaves each time a new shoot is made. During hot weather the plants will require copious supplies of water and benefit from a slight shading of the glass. Cucumbers appreciate frequent light top dressings of rich compost. In order to prolong the period of bearing, thin out the young Cucumbers, retaining only sufficient of the best for a continuous supply.

Melon plants in frames should now be growing freely, and the training of the plants depends upon the number growing under a frame light. Where two plants have been placed in the centre of a frame light the main shoots should be stopped about the fourth rough leaf and two main laterals from each plant trained to the corner of the frame and stopped within 6 inches of the sides of the frame. These laterals will form sub-laterals which should be pinched at one leaf

beyond the female flower. Endeavour to select two or more flowers of the same age on one plant and fertilize on the same day. Syringe and water the plants according to prevailing weather conditions.

Continue to pinch at one leaf the sub-laterals of Grape vines growing under glass. After the berries have "stoned" they should swell rapidly to their full size, and before this takes place the bunches should be examined with a view to removing any surplus berries which may still exist. This is a good time to apply a feed either in the form of liquid manure or one of the approved vine fertilizers. Exercise care in ventilating the house in order to reduce the possibility of "scalding" the berries; it is advisable to maintain a free circulation of air, especially during the night, by keeping the ventilators open a little during that period.

Continue to tie the young shoots of Peaches and Nectarines as they develop, and complete the final thinning of the fruits. Daily syringing should be carried out except when weather conditions are unfavourable, but should cease for a time when the fruit is ripening. In a normal season the fruits of early varieties, such as Peach 'Hale's Early' and Nectarine 'Early Rivers,' should be swelling rapidly and ripen towards the end of the month. Before the fruits become soft they should be exposed to maximum sunlight by tying back any overhanging foliage or, if necessary, by placing a large wooden label behind the fruit.

EMBOTHRIUM COCCINEUM.

THIS fine plant has a most undeserved reputation for tenderness, undeserved at any rate as far as the narrow-leaved forms are concerned.

These narrow-leaved forms, every one of many plants of them, withstood 34 degrees of frost here this winter without the slightest injury to leaf or to flower bud; and in the prolonged frosts of 1940-1941, when again there was a temperature round zero, even young newly-planted specimens were entirely uninjured.

The narrow-leaved variety has long been known in Ireland, notably at Rostrevor, and other forms of it, some of them almost deciduous, were introduced by COMBER from the Andes, and these last at any rate can be regarded as hardy plants.

Embothriums should be more freely planted than is the case. They grow in any lime-free soil; they stand the wind, they are easily propagated either from seed, which sets freely, or from suckers which come up occasionally naturally, or better if one wounds one of the roots a few feet from the main stem. Young plants grow extremely fast and therefore want careful staking.

It is interesting to be able to grow at any rate one hardy representative of the wonderful family of Proteaceae, which produce such outstanding blooms in South Africa. The flowers of the Embothrium, which comes from Chili, make up in number and in colour what they lack in individual importance.

Teloepa truncata, which one can also grow in this country, is perhaps more typical of the Proteaceae, but it is not so hardy as Embothrium, though again this can be seen flowering here this year high above the shelter of a wall against which it was planted and where it felt the full 34 degrees of frost. *Teloepa speciosissima*, however, has proved much less hardy than *T. truncata*, and has now been lost at Bodnant.

ABERCONWAY.

FLORISTS' FLOWERS.—V.

THE AURICULA.

By KENNETH CHARLES CORSAR.

THE history and the origin of our garden Auriculas are subjects which have been under discussion for a great many years, and much speculation and many writings have resulted therefrom. Apart altogether from a determination of when Auriculas first came to be cultivated in gardens, or recognized as Florists' Flowers, there is the infinitely more difficult problem yet to be resolved, namely, whence came the Auricula as we know it, and what is its ancestry? The final answer has not yet been given, but there is now sufficient material available upon which to base a theory. This very subject was under discussion at the R.H.S. Primula Conference of 1886, when the deliberations hinged on a paper written by KERNER eleven years earlier. In this paper the opinion is expressed that the Auricula of gardens is derived from *Primula Auricula* L. and *P. hirsuta* All., whose union produced *P. pubescens* Jacq., which was the parent plant; KERNER derives both the Show and the Alpine forms of the Florist's Auricula from the same source. This opinion cannot, however, be accepted as the full explanation of the origin of the modern Auricula, and it was hotly contested at the Conference by Mr. SHIRLEY HIBBERD, a noted florist in his day. This authority gave it as his view that the general agreement of the Alpine Auricula was with *P. commutata* Schott. and *P. Pedemontana* Thomas; he also considered that *P. ciliata* Moretti, along with *P. Auricula*, might have played a part in the production of our Show varieties. Collected natural hybrids of *P. Auricula*, unlike most species hybrids, are fertile, and consequently batches of seedlings can be raised which will reproduce to a greater or a less degree the different characteristics of the parents.

In support of his opposition to the KERNER theory, HIBBERD quotes the opinion of Dean HERBERT, a careful observer and student, who goes even further and suggests that *P. Auricula*, *P. helvetica*, *P. nivalis* Donn., *P. Auricula* var. *ciliata*, and *P. viscosa* all had an influence in the production of the garden Auricula. This view may not be so very wide of the mark, and it is now held by leading botanists that at least three of the Primulas named by HERBERT are comprised in *P. Auricula* and its varieties. At the same Conference, Mr. J. G. BAKER restated his theory that the great mass of the garden Auriculas originated from the wild species *Primula Auricula*, and from its varieties and hybrids. The meal borne by the Linnean type of this Primula indicated to him the ancestry of the garden Auricula, particularly those of the Show section. BAKER also drew attention to the variety *P. venusta* Host., pointing out that it bears purple flowers, and stating, "I think it is extremely likely that it is from this that the purple colour of many of the garden Auriculas has come." BAKER's final conclusion is that the progenitor of what we know as the Alpine Auricula is *P. pubescens*, whereas other forms, notably what he calls the common garden Auricula, have a very mixed parentage.

The final word on this very complicated subject has not yet been spoken. Though it is true that many seedlings of *P. pubescens* bear a strong resemblance to Alpine Auriculas, these have shown such marked variation at different stages in their development that it becomes obvious that the influences at work are greater and more

numerous than has previously been recognized. While the main characteristics of Alpine Auriculas, and of the self-coloured members of the Show section, may be traced to Primulas found growing wild in many parts of Europe, the edged forms, so popular with gardeners, do not have any counterpart in nature ; none of the Primulas named above exhibit any tendency to produce flowers with green, grey or white edges to their petals. These decorative edgings are due to a greater or a lesser concentration of minute wax-secreting hairs, and all

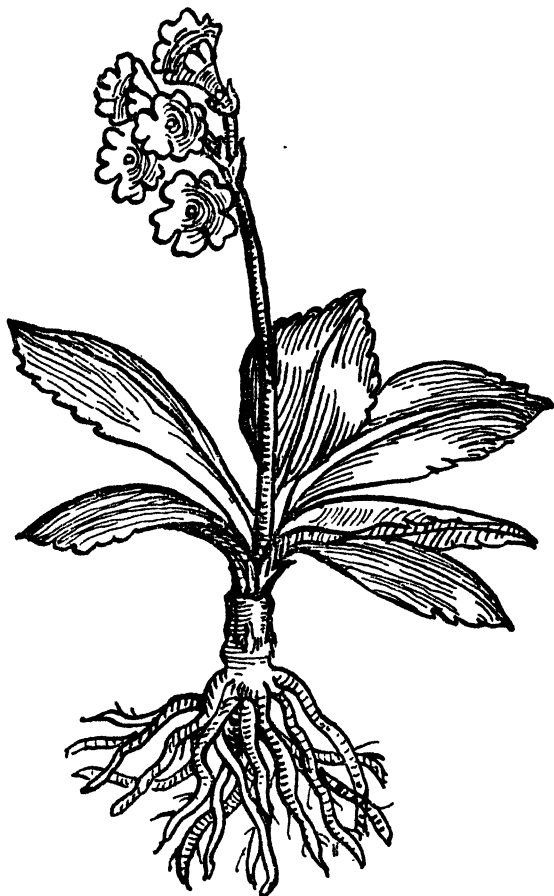


FIG. 60.—FROM LOBEL'S *Plantarum Historia*, 1556. AURICULA URSI LUTEA.

the edged varieties have in reality green edges under this rim of hairs. In a recent paper, Sir ROLAND BIFFIN has put forward the theory that the green-edged flower is no more than an example of the phenomenon which botanists term phyllody, or frondescence, but adds that it is not known if this mutation is to be found in nature. The problem, BIFFIN points out, is to discover the source of the green edge, but he is unable to point to a complete solution. What may be said with certainty is that the edges are not the result of the Auricula breeder's efforts, for it is a well-established fact that a breeder cannot create a new character. However, an examination of the foliage leaves of the

edged Auriculas may afford a clue to their origin. These follow the characteristics of two of the *Primula* species most likely to be the parents of the Florist's Auricula, namely *P. Auricula* and *P. hirsuta*, and on whether they approximate more to one parent than to the other, will depend the class into which a particular plant will fall. The most conspicuous feature of a Show Auricula, that is to say the mealy deposit on the pips and leaves, would appear to be inherited from *Primula Auricula*, and yet the description of that plant merely states that it is "mealy towards the throat"; in the Florist's Auricula this is not enough. The well-developed characteristics of the leaves, stems, and calyces in the grey and white edged, and in the self Auriculas are to be found in nature among the members of the "Auricula" section of the genus *Primula*; yet it cannot be said that any deliberate use was made of them in the production of the Florist's Auricula.

No clear-cut statement on the origin of the Auricula as we know it, which is entirely convincing, has as yet been made, and it is doubtful if a solution of the problem will ever be found. The system of selection adopted by breeders of Auriculas has always run along the lines of taking only those forms which are different in themselves, and the longer such a process goes on, the further away from the original and first cultivated hybrids do the garden forms stand. Hence the difficulty in determining the derivation of the modern Auricula; hence, also, the growing impossibility of producing an accurate and conclusive statement which would clear up all the many points still in doubt.

It is generally agreed that the Florist's Auricula has been cultivated in gardens throughout Europe for more than three hundred years. Its introduction into the British Isles is attributed to those weavers, and other artisans, who fled to this country from Flanders in or about the year 1570, seeking refuge from the troubles in their homeland, and carrying with them their favourite flowers. These refugees settled largely in the Midland counties of England, which area, to a great extent, has been the home of the Auricula ever since. Since those early days botanists and writers on floras and gardens have described and figured the Auricula in their works, usually under the name of *Auricula ursi*. From a work by LOBEL and PENA, published in 1605, we learn that purple, rose, and white Auriculas were widely grown in English gardens. Some idea of the further development of the flower may be gained from PARKINSON's famous *Paradisi in Sole*, published in 1629, in which a considerable number of "Beards' Ears" are described and depicted; and from these it is clear that by this time flowers having a paste centre were in cultivation. The leaves of some of PARKINSON's favourite varieties are, we are told, "somewhat mealy or hoary upon the greenness." In all, this writer describes twenty-one different Auriculas, but, he assures his readers, "there are so many sundry and several sorts," that space does not permit of mention of any more. The great number of varieties is also referred to by Sir THOMAS HANMER in 1659, and probably for the first time named varieties are mentioned by this writer.

By the time that JOHN RAE and his son-in-law SAMUEL GILBERT were writing, Auriculas would seem to have been classified according to their colours, but without any reference to the manner in which the colours were arranged on the pips, or to whether there was paste on leaves or flowers. It was not until the end of the eighteenth century that anything approaching a definite system of classification of Auriculas can be detected. Yet there is still no mention of anything like

edged forms. HANBURY, in his *Body of Gardening* (1707), discusses striped and variegated varieties, which may have been the forerunners of the edged sorts, but probably the first authentic statement on the subject of edged Auriculas is to be found in SLATER'S *Amateur Florist's Guide* published in 1776. One after another, writers on flowers and gardening continue to mention the Auricula as one of the most popular of garden plants, and many of them emphasize the growing degree of selection practised by fanciers. The constantly growing number of varieties is also frequently referred to, as well as the high standard of excellence which raisers had set before themselves.

By 1858, the year in which EMMERTON published his classic treatise on the Auricula, the sub-division of varieties into edged and self-



FIG. 61.—FROM PARKINSON'S *Paradisi in Sole*, 1629. AURICULA URSI
FLORE TANNETIO, TAWNY BEARES EARES.

coloured groups had become general, and the author gives a list of what he considers to be the sixty-three best edged varieties as well as fifteen selfs. There was still no mention of what we now know as the Alpine Auricula. About the year 1847 GEORGE GLENNY practically stereotyped the points of the Auricula, and though they may have been somewhat modified within recent years, the flower as he describes it is the Show Auricula of to-day. Since the days of the first writers on the Auricula, great advances have been made in the development and form of the flower. The first forms to be grown would appear, from the figures in such works as those of PARKINSON, to be more of the type now named Border Auriculas than the modern Show or Alpine varieties. But by EMMERTON'S day the edged types at least, if we may judge from the illustrations in his book, are very similar to those of the present day, though how they would compare with

modern edged varieties, if the two sets were placed side by side, it is difficult to say. The fact remains, however, that the care and attention paid to breeding and selection over a long period of years has resulted in the existence to-day of a range of varieties of very high quality.

Towards the end of last century greater attention was being paid by a small group of growers to the improvement of the so-called Alpine Auriculas. CHARLES TURNER, of Slough, starting with very little in the way of stock material on which to found a family, had, by 1883, raised a seedling in this section which received recognition. Until the coming of TURNER the attention of Florists had been concentrated almost exclusively on the edged and self-coloured forms, regarding as of little consequence those with the shaded petals. But gardeners in the north of England were attracted by the new type, and the popularity of the Alpine Auricula spread rapidly through that part of the country; fanciers in the south continued yet awhile to prefer the older edged forms. The connecting link between the older generation of Auricula enthusiasts and the new was the Rev. F. D. HORNER, one of the most outstanding florists of his day. Working in conjunction with BEN SIMONITE, this eminent amateur raised many thousands of Auricula seedlings, some of which are still grown and admired. It is, perhaps, worthy of note that varieties raised by HORNER and distributed through the agency of SIMONITE, have survived in greater numbers than those of any other of the early growers, the majority of whom were amateurs. This fact would seem to prove that the change of soil and climate, brought about by the more or less widespread distribution of plants, has proved beneficial to their constitution, for only those varieties which found their way to districts remote from their birthplaces have survived for any appreciable length of time.

Anything like a catalogue of those who have been responsible for the production of the Auricula as we know it to-day, would be of little interest to any but the historian of the family; nevertheless, mention must be made of one of the men whose work has left so outstanding a mark on the form of the modern Auricula. It is to the skill and labour of JAMES DOUGLAS, of Great Bookham, that we owe so many of the best varieties both of Show and Alpine Auriculas which now figure so largely in present-day collections, varieties excellent in themselves and also, what has been of even greater importance, the healthy parents of a numerous progeny. It was once said that there were fewer good growers of Auriculas than of any other of the Florist's Flowers; if this be an accurate statement, then it cannot be denied that such as there were attained to a very high standard of proficiency, for the Auricula, as handed down to us by the old Florists, is, in spite of some perversities, a thing of beauty and, consequently, a joy for ever. At one time it was considered that the Florist's Auricula was difficult to manage, but this is assuredly not the case. It is true that the plants require care and attention, but the same can be said of anything outside the general category of "weeds." The Alpine Auricula will thrive in the open border all the year round just as readily as will the Carnation or the Delphinium, and the Show varieties are not more difficult to handle in pots than are any normal greenhouse plants. A perfectly simple compost of loam, leaf-mould and sand is all that they ask for, and anything approaching the quite nauseating concoctions recommended by EMMERTON and his contemporaries should be eschewed. Moreover, the space demanded by a very representative collection of Auriculas of all sections is small, so that we have in them the ideal

Florist's Flower for that size of garden which will probably be the normal in this country for many years to come.

In the years immediately preceding the outbreak of the present war there was a very marked increase in the number of gardeners, both professional and amateur, who took an active interest in the raising and cultivation of the Auricula. Present-day conditions are, unfortunately, such that the growing of purely ornamental flowers has had to be suspended; but the time may not be far distant when pleasure gardening, as distinct from utilitarian horticulture, will return. Then, it is to be hoped, the Auricula will once more come into its own; and there would seem to be no reason why this should not be, as once it was, one of the most popular subjects in the garden.

(*Illustrations, Figs. 62-64.*)

SOME TREES AND PLANTS IN PALESTINE.

By MAJOR F. H. NORRIS.

I HAVE tried to describe in this article the most interesting shrubs and flowers which I found in and around the small forestry reserve on the Jaffa to Jerusalem road. This is a particularly good place for flowers because the goats and livestock are not allowed in the reserve, and the cultivated terraces on the opposite side of the valley, being partly in Wheat and Barley, the stock are kept off during February, March and April when the flowers are at their best.

Owing to the lack of a good book of reference during the spring, I was unable to identify many flowers. The names are taken from Post's *Flora of Syria, Palestine and Sinai*. The height and size of many plants in Palestine depend very much on soil, moisture and location, which adds to the difficulty of identification.

The road from Jaffa after leaving Ramleh crosses open arable country for some miles before climbing the hills to Jerusalem. In the middle of March the sun is quite hot during the afternoon. The Barley and bearded Wheat is well up and the earliest fields would be ready to be pulled or cut with a hook by the Arabs at the end of April. Large stretches of land were being ploughed by camels, oxen or mules for sowing Sorghum, the Arab durra (Millet), which matures without rain and is used for coarse bread and often mixed with other grain. Sesame is also sown after the rains about the same time, a Labiate grown for its oleaginous seeds; both Millet and Sesame probably came from Egypt in prehistoric times. Nearer the villages patches of bush Marrows, Cucumbers, Melons and Tomatoes will soon be coming up; the Arab, whose only tool except the plough appears to be a very large hoe, sows the seeds of these plants a long way apart, so that a considerable part of the ground is actually fallow, especially after a dry winter when the plants are probably smaller. There is very little rain after the end of March until the following winter, but the soil does not dry out nearly as quickly as one would expect.

The road passes several stone villages built on rising ground and low hills of limestone outcrop, reminding one of parts of Clare and Galway. At the foothills the road runs close to the fine Trappist Abbey at Latrun begun in Turkish times and not yet finished; it is well known for its wines and brandy. There is a big difference between the bare, open, poorly farmed land of the Arabs and the fenced-in, well cultivated fields, vineyards and olive groves of the monks. Their

winter garden is close to the farm building and manure heap, while the irrigated summer garden is some distance away near a stream. Later in the spring I noticed in the fields a few plants of *Anchusa azurea* (*italica*) which had recovered from being ploughed over. In April the five-foot spikes of *Echium glomeratum* were easily seen on the waste land by the stream, and other Echiums (*Vipers Bugloss*), *E. italicum* and *E. judaicum*, were growing by the roadside.

A little way past Latrun on the left is the small Government nursery for trees; thousands of seedling trees are growing in old petrol tins under the shade of vines and trees, watered by an Arab and his boy from the spring water which runs through the nursery.

As the hills close in on either side of the road the forestry reserve begins and runs up to the top of the steep hillsides on either side. The trees appear to be about 12 to 15 years old, mostly *Pinus halepensis* (Jerusalem Pine), some *Cupressus sempervirens pyramidalis* (Cypress), and a number of Acacias, probably *A. saligna* and *cyanophylla*, which were covered with long racemes of golden bloom. The hillsides are too rocky and steep for the trees to be planted very close and there is enough light for many flowers to grow. Small seedlings of *Pinus halepensis* are coming up under the trees.

In the middle of March, small varieties of the Tazetta Narcissus, probably the Rose of Sharon of the Bible, were nearly over, though earlier in the month bunches could be bought in Jerusalem; the bulbs, 3 to 5 inches deep, mostly bore flowers. Nearby, I found one or two plants of *Mandragora officinarum*, the Mandrake or Love Apple; the flowers were over, but later in June the succulent pale yellow berry, the size of a large Cape Gooseberry, is ripe, and has a fragrant smell. (Solomon's Song, vii. 13: "The mandrakes give a smell.") *Iris palaestina* was fairly plentiful among the trees, the very soft bulb covered with membranous coats grows about 3 inches below the surface.

At the foot or in the crevices of most of the large limestone rocks *Cyclamen persicum* was growing, not quite so vigorous under the Pines as in the open; it is one of the most lovely flowers in Palestine. In the spring bunches are on sale in Jerusalem and later corms can be bought. The flowers last very well in water if picked when fully out; the stems are about 9 inches long, sometimes more. A bowl of them arranged with their marbled foliage makes a delightful table decoration. The colour varies from pale pink to nearly white, but all have the deep reddish-pink at the base of the petals. In the heavy soil at the foot of the rocks they grow 2 to 4 inches deep; the leaves shoot from brittle underground stems; if one is collecting corms, care should be taken to get them from the shallow soil in the crevices; there the leaves grow from the corm, and not from a stem. Only two or three flowers on each plant usually set seed; there were seldom many plants close together.

A little later two annual Campanulas, probably *C. sulphurea* and the blue *strigosa*, were in flower, both only about 3 to 6 inches high, on this dry hillside. On some open rocky patches *Asphodelus aestivus* was still flowering and a few bulbs of the autumn flowering Squill, *Urginea maritima*, had large lily-like leaves. These huge bulbs can be seen in large numbers ploughed up by the Arabs nearer the coast; in the late summer they throw up spikes 3 feet or more high; the leaves come up in the winter.

In mid-March, low bushes of the pink *Cistus villosus* were in bud. *Poterium spinosum*, the Thorny Burnet, a small shrub 15 inches or

more high, grows all over the hillsides and is supposed to have been used for Christ's crown of thorns; it is used as fuel by the Arabs. (Ecc. vii. 6: "The crackling of thorns under a pot.") *Anemone coronaria* grows among them as in the Song of Solomon (ii. 2: "As the lily among thorns"). The only use I found for the spiny branches of the Burnet was to support flowers in a bowl. Towards the top of the ridge *Gladiolus segetum* had seeded itself freely but was not in flower till the end of March; POSE thinks that this was the Lily of the Field (Luke, xii. 27), but I doubt this and prefer to agree with other authorities that the scarlet *Anemone coronaria* is meant.

Among many plants *Helichrysum sanguineum*, 8 to 12 inches high, was very noticeable with its grey woolly leaves and crimson heads opening a few weeks later to small yellowish flowers. An Ornithogalum, perhaps *O. ciliatum* (Star of Bethlehem), was plentiful among the trees on the ridge top, the 6 to 9 inch spikes having white flowers striped green. *Salvia triloba* makes small bushes and its leaves are used as medicine by the Arabs.

Further along the ridge in the open places there were quantities of *Iris Sisyrinchium* at the end of March; this is one of the loveliest bulbous Irises, but unfortunately the flowers only open after midday and fade as soon as the sun sets. Some have a number of flowers on the same stem and as many as three or four may be out at once; the Crocus-like bulbs in the heavy limestone soil on the hills are about 3 or 4 inches deep, while those in the hard sandy soils near the coast were 9 inches deep. The leaves of those in sandy soil were much narrower and more grass-like than those on the hills, the latter having mostly blue flowers and the former varying from pale blue to reddish-purple. In the hills they were most plentiful along the Arab tracks where rain, man and beast had spread the seed.

On this side of the wadi facing south the patches of shallow-rooting *Anemone coronaria coccinea* and *Ranunculus asiaticus* quickly dry up unless there are frequent showers. From the edge of the forestry reserve I looked north across the bare limestone hills of Judaea with terraces on some of the hillsides growing scanty crops of Wheat or Barley; never did so much work grow so little.

Open places along the ridge were covered with *Cistus villosus*, Sages, Prickly Burnet, evergreen scrub Oak (*Quercus pseudo-coccifera*), *Satureia Thymbra*, whose attractive spikes of purple flowers in May last for several weeks. Among many annuals and biennials were several Scabious with small insignificant flowers, the April-flowering pink *Centaurea Dinsmoreana*, *Centaurea cyanoides*, the blue Syrian Cornflower, flowering in March, and a handsome white May-flowering *Daucus* of the Carrot family.

Going down to the road again I saw various plants of interest; in March the young shoots of *Capparis sicula* (*spinosa*), the Thorny Caper, were coming up through last year's dead stems; in June the white flowers, full of long purple stamens, fade in the hot afternoon sun. It often grows in walls; the Arabs are said to use the buds for pickling.

Echinops spinosus was growing near the road; in June its handsome blue heads were sometimes nearly as large as a tennis ball; after the manner of many Palestinian plants, it is armed with long spines; unfortunately it does not last in water. Among various thistles by the roadside *Notobasis syriaca*, the Syrian thistle, was conspicuous with its reddish spines.

Among some stones a solitary plant of *Arum palaestinum*, the black Calla, was growing ; in April it is easily noticed, as the large green spathe is blackish-purple inside ; it was more plentiful in sandy fields near the coast. A few plants of *Erodium grunium* had been flowering in the morning, but even in early March the lovely blue flowers will be over by 9.30 A.M., if it is a sunny day.

A wayside tomb was shaded by an evergreen *Quercus palaestina*, Abraham's Oak, which is a holy tree. In a damp place by the water-course a few shrubs of the lilac-flowered *Vitex Agnus-castus*, the Chaste tree, were throwing up new shoots ; it is very common in the wadis on the plain, and flowers in June, and is sometimes used for colic and as a yellow dye. An old friend from English cornfields, *Adonis autumnalis*, the European Pheasant's Eye, was flowering in March ; it was probably introduced into England in very early times with grain from the Continent.

The natural limestone terraces have been improved by the Arabs removing stones and building up bits of wall to counter soil erosion. Well-worn paths climb the hillside to houses and a village on the hilltop. On some similar track, Christ may well have spoken the parable of the sower. The narrow terraces a few yards wide grow only a little good grain ; as the sower broadcasts, some seed will fall close to the thorns (*Poterium spinosum*), some on the rocky ground at the edge of the terrace, other on the track, where it will be trampled or eaten by the village pigeons.

Everywhere there were small patches of scarlet *Anemone coronaria*, some of the blooms being as large as our garden varieties though not quite so coarse in the stalk ; near them and in among them clumps of *Ranunculus asiaticus* were in bud, opening at the end of March with the last of the Anemones ; most of them were similar in colour to the Anemones and almost as large.

Spikes of the wild Hollyhock, *Althaea rosea*, were already in bud ; when in flower in April they were about 6 feet high. I found two or three plants of *Althaea acaulis*, the stemless Hollyhock, an attractive plant with small leaves which only partially hide the pink flowers, smaller than those of *A. rosea*.

On this side of the valley *Cyclamen persicum* is at its very best, one plant carried 28 blooms ; a corm dug up by an Arab cultivator was 5 inches across. Among several Orchids were *Anatolica*, purple, and *Serapias vomeracea* (*pseudo-Cordigera*) with maroon flowers ; also *Orobanche lavendulacea*, lavender Broomrape, which has branches from the main stem. In shady places under the rocks the small *Arum Dioscoridis* and *Symphytum palaestinum*, a creamy Comfrey, were flowering.

Adiantum Capillus-Veneris, Maiden Hair Fern, and the Scale Fern, *Ceterach officinarum*, grew in the damp crevices of some large limestone rocks ; in some places the latter, being exposed to the sun, curled up for the summer, reviving in the winter. Among the rocks the yellowing green of a shrubby Spurge about 2 feet high showed up vividly in the bright sunlight.

The prickly *Smilax aspera*, with a few bunches of crimson berries, clambered over the rocks ; also *Clematis cirrhosa*, which was over in March, and a rather poor Honeysuckle, not yet out. *Spartium villosum* (*Calycotome villosa*), the Thorny Broom, was in full flower and continues for some weeks, the thorny bushes, 3 to 5 feet high, being covered with small yellow flowers, though sometimes insects damage the buds rather badly.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

APRIL 17, 1945.

DAFFODIL COMPETITION.

Chief Awards.

The Peter Barr Memorial Cup awarded to someone who has done good work on behalf of the Daffodil.

To Mr. Alec Gray, Penpol, Truro.

The Engleheart Challenge Cup for 12 varieties of Daffodils raised by the exhibitor.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim.

THE SEWELL MEDAL COMPETITION.

Amateurs' Medal.

To Dr. P. L. Giuseppi, Trevoze, Felixstowe.

Horticultural Traders' Medal.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead.

SCIENTIFIC COMMITTEE.—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Tomato with four Cotyledons.—Mr. John Parkin of Wigton sent a seedling Tomato plant with four cotyledons, each of the normal two having apparently branched from the base to form two apparently normal cotyledons of the usual size.

Leek moth—a new pest.—Mr. G. F. Wilson showed specimens of the minute Leek moth which has recently appeared in South-east England and now extends to 15 miles from the coast, the caterpillar of which tunnels into the leaves of Leeks and Onions. It is difficult to control, though Tobacco dust is a useful insecticide against it. It is desirable that any attack should be reported as soon as seen.

Witches-broom in Scots Pine.—Mr. A. B. Jackson showed a remarkable witches-broom on a branch of Scots Pine, formed of a multitude of closely-packed shoots 2 or 3 inches long, the mass bearing no little resemblance to a hedgehog. It occurred at Old Ynysybul. The exciting cause is unknown.

Sarcococca sp.—The Hon. Lewis Palmer of the Old House, Wonston, Sutton Scotney, Hants., made some remarks upon the genus *Sarcococca* of which he believes about six species are in cultivation in this country, but he finds their nomenclature often at fault. He would be glad to receive specimens of any unusual form as an aid to straightening out their nomenclature.

Persea indica.—Captain Collingwood Ingram sent a piece of the shrub *Persea indica*, a native of the Canary Islands, which has come through the winter in his garden and is now flowering.

Rhodoleia Forrestii.—Mr. M. Williams of Lanarth, St. Keverne, Cornwall, sent a branch of this uncommon evergreen shrub from his garden. It has smaller inflorescences than the long-known *R. Championii*, the conspicuous part of the inflorescence being the bracts and the stamens and styles. The petals are very narrow spatulate, and, like the sepals, soon fall. A Botanical Certificate was unanimously recommended for this plant.

Ceanothus purpureus.—Mr. W. Dallimore sent flowering branches of *Ceanothus purpureus*, a very uncommon species with inflorescences much like *C. rigidus* but with evergreen leathery ovate leaves about an inch long with large rigid teeth. The leaves when they fall leave a large projecting growth which gives the branches a peculiarly rugged appearance.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. Secrett, V.M.H., in the Chair, and seventeen other members present.

XXXIV PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Exhibits.

- Apple 'Belle d'Avril,' from N. S. Chalmers-Hunt, Esq., Gamels Hall, Hereford.
Apples 'French Crab,' and 'Sturmer Pippin,' from H. T. Barnett, Esq., Westwood House, Tilehurst, Berks.
Collection of Salads from Messrs. Allwood Bros., Haywards Heath.
Morel, and Good King Henry, from Lord Leconfield, Petworth Park, Petworth, Sussex.
Strawberry 'Redbourn,' from Mr. G. Stanley Dunn, The Hame Nursery, Hemel Hempstead Lane, Redbourn, Herts.

FLORAL COMMITTEE A.—Mr. W. R. OLDHAM, V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations and *Dianthus Allwoodii*.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Polyanthus.

Flora Medal.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

Banksian Medal.

To Messrs. Biddlecombe Bros., Bracknell, for an exhibit of Carnations.

To Messrs. W. A. Constable & Co., Tunbridge Wells, for an exhibit of Tulips, Daffodils, Polyanthus, etc.

Selected for trial at Wisley.

Polyanthus 'Couichan,' from Messrs. Blackmore & Langdon, Bath.

Polyanthus seedling, 'Gold Laced,' Nos. 1, 2, 3, 6, 7, 9 and 10, from C. J. Howlett, Esq., Earley, Reading.

Primula 'Blue Peter,' from Major E. de Rothschild, Exbury, Southampton.

Other Exhibits.

Auricula 'Ann Crowhurst,' from Mr. J. Crowhurst, Burgess Hill.

Polyanthus with colour changing flowers, from W. F. M. Copeland, Esq., Ashurst, Southampton. Referred to Scientific Committee.

Polyanthus 'Stanton's Giants,' from Mr. H. Stanton, Chippenham.

Primulas 'Bridget,' 'Charles Bloom,' 'John Hammond,' from Burleydam Nurseries (Oaken), Ltd., Wolverhampton.

Primulas 'Fidelity,' 'Winston,' from Mrs. A. Fremantle, Penn.

Viola 'Leslie,' from Iden Nurseries, Staplehurst.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering trees and shrubs.

To Mr. E. Ladhams, Elstead, Surrey, for an exhibit of Alpine plants and flowering shrubs.

Silver Flora Medal.

To Messrs. Notcutt, Woodbridge, Suffolk, for an exhibit of flowering trees and shrubs.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of flowering trees and shrubs.

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, Crawley, for an exhibit of flowering trees and shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, Sussex, for an exhibit of Alpine plants.

To Messrs. L. R. Russell, Ltd., Windlesham, Surrey, for an exhibit of flowering trees and shrubs.

Flora Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

Award of Merit.

To *Myrtus Lechleriana* as a hardy, flowering shrub (votes 13 for, 0 against), from G. H. Johnstone, Esq., Trewithen, Cornwall.

To *Pieris* sp. as a hardy, flowering shrub (subject to naming, votes 15 for, 0 against), from G. H. Johnstone, Esq.



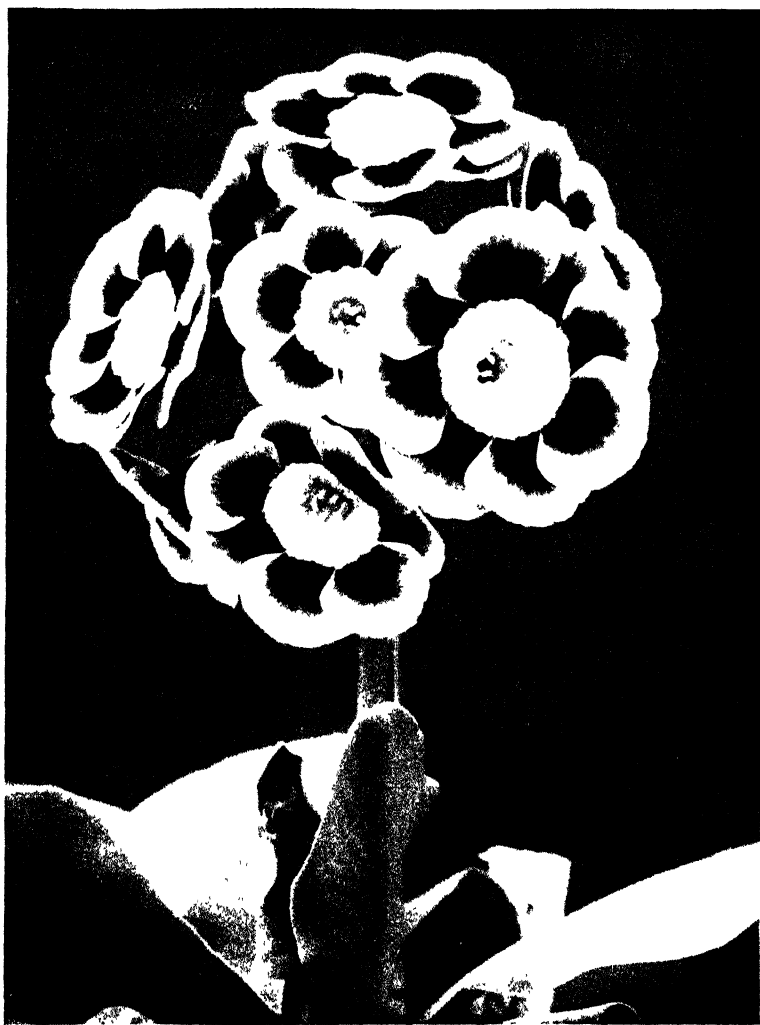
Photo, Maloy.]

FIG 62 ---AURICULA 'BARTLEY'
(See p. 196)



Photo, Malby]

FIG. 63 AURICULA 'JOY'
(See p. 196.)



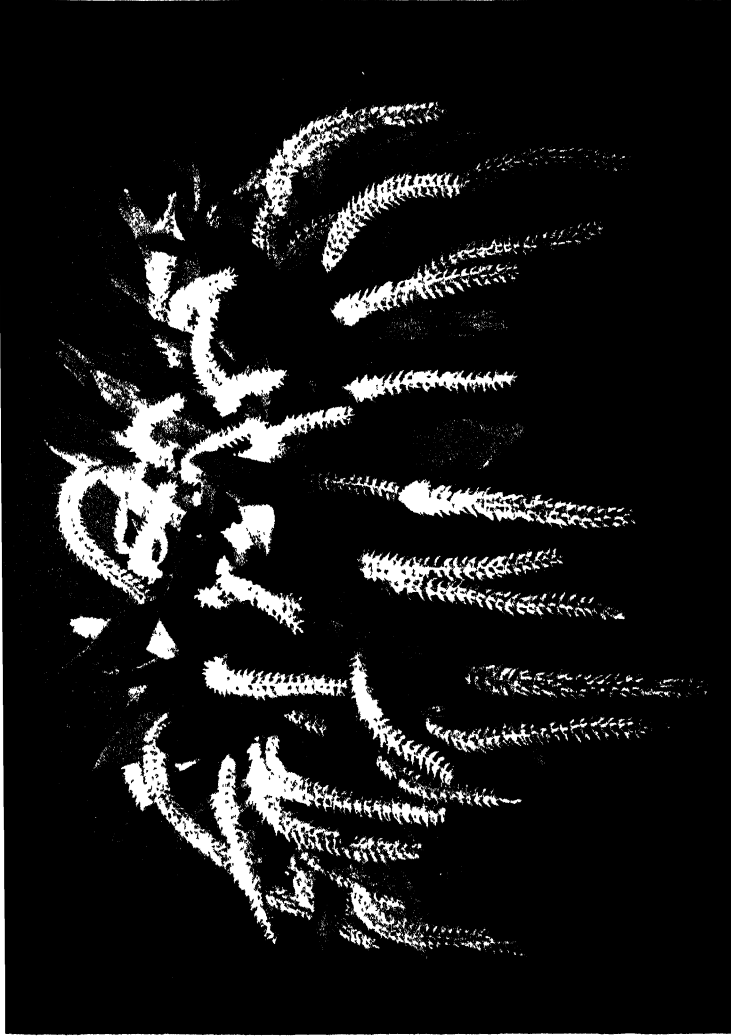
Photo, Malby.]

FIG. 64 - AURICULA 'KATHARINE'
(See p. 196)



Photo. E. K. Ashton

FIG 65 ---BRASSIA VERRUCOSA IN MR E R ASHTON'S COLLECTION
(See p 208)



Photo, F. R. Ashton]

FIG 66 - DENDROCHILUM GLUMACEUM (SYN. PLATYCLINIS GLUMACEA), IN MR. E. R. ASHTON'S COLLECTION

(See p. 208)



Photo, E. R. Ashton.

FIG 67.—*DENDROBIUM THYRSIFLORUM*, IN MR E. R. ASHTON'S COLLECTION.
(See p. 208.)



Photo E. R. Ashton]

FIG. 68. *PINUS MARITIMA* IN MR E. R. ASHTON'S COLLECTION

(See p. 208)



Photo, F. R. Ashton.]

FIG 69 —ODONTOGLOSSUM WILLIAMSIANUM, IN MR E. R. ASHTON'S COLLECTION.
(See p 208.)

To *Prunus serrulata* 'Pink Perfection' as a hardy, flowering tree (votes 14 for 1 against), from Messrs. John Waterer, Sons, & Crisp, Ltd., Bagshot, Surrey.

Cultural Commendation.

To Mr. E. Ballard, Colwall, nr. Malvern, for a pan of *Jankaea Heldreichii*.

Other Exhibits.

Ceanothus purpureus, exhibited by W. Dallimore, Esq., Bidborough, Kent.

Fritillaria Imperialis vars., exhibited by the Dowager Lady Loch, Stoke-by-Clare, Suffolk.

Mertensia nutans, exhibited by G. H. Berry, Esq., Enfield.

Persea indica, exhibited by Collingwood Ingram, Esq., Benenden, Kent.

Rhodoleia Forrestii, exhibited by M. Williams, Esq., St. Keverne, Cornwall.

Hardy flowers, exhibited by Messrs. C. Elliott, Ltd., Stevenage.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

First-class Certificate.

To *Laeliocattleya* × 'Resolute' var. 'Rapture' (*Lc.* 'Mrs. Willoughby Pemberton' × *Lc.* 'Aphrodite') (votes 12 for, 0 against), from H. W. B. Schröder, Esq., Dell Park, Englefield Green, Surrey.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and twenty other members present.

The Peter Barr Memorial Cup.

It was unanimously recommended that the Peter Barr Memorial Cup, which is awarded annually to someone who has done good work on behalf of the Daffodil, be awarded in 1945 to Mr. Alec Gray, Penpol, Devoran, Truro, for his work in cultivating, hybridizing and exhibiting miniature Narcissi.

Awards Recommended :—

Silver-gilt Lindley Medal.

To Mr. Alec Gray for an exhibit of Miniature Daffodils.

Silver-gilt Flora Medal.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for an exhibit of Daffodils.

Silver-gilt Banksian Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Tulips and Daffodils.

Award of Merit.

To *Narcissus* 'Moina' as a variety for exhibition (votes 12 for, 0 against). Raised in Tasmania by Mr. C. E. Radcliff, and shown by Mr. Guy L. Wilson.

Other Exhibits.

Daffodils, shown by D. Cobb, Esq., 11 Price's Avenue, Margate.

Daffodils, shown by Messrs. R. Wallace & Co., Tunbridge Wells.

Daffodils, shown by Mr. M. P. Kooper, Muirfield, Victoria Rd., Ferndown.

Narcissi 'Interim', 'Red Hackle', 'Indian Summer' and 'Hunter's Moon,' shown by Mr. Guy L. Wilson.

Narcissus 'No. 300,' shown by Major E. de Rothschild, Exbury, Southampton.

Tulipa Bakeri, shown by G. P. Baker, Esq., V.M.H., Hillside, Kippington, Sevenoaks.

Tulipa Orphanidea, shown by R. D. Trotter, Esq., Leith Vale, Ockley, Surrey.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Lady BRODIE HENDERSON in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To 'Kathleen Stevens,' as a show and market variety (votes 7 for, 0 against), shown by Messrs. Biddlecombe Bros., Moss End Nurseries, Bracknell, Berks. See p. 214.

Exhibit.

'Raymond Biddlecombe,' shown by Messrs. Biddlecombe Bros., Bracknell, Berks.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron* 'Carita' (*R. campylocarpum* × *R. 'Naomi'*) (votes 6 for, 0 against), from Major E. de Rothschild, Exbury, Southampton.

To *Rhododendron saluenense* (votes 7 for, 2 against), from Major E. de Rothschild.

To *Rhododendron* 'Alison Johnstone' (*R. yunnanense* × *R. concalenans*) (votes 9 for, 0 against), from G. H. Johnstone, Esq., Trewithen, Cornwall.

To *Rhododendron* 'Matador' (*R. strigillosum* × *R. Griersonianum*) (votes 7 for, 0 against), from Lord Aberconway, Bodnant, Tal-y-Cafn.

To *Rhododendron* 'Aspasia' (*R. 'Astarte'* × *R. haematodes*) (votes 9 for, 0 against), from Lord Aberconway.

To *Rhododendron* 'White Beauty' (*R. 'Albino'* × *R. Loderi* 'Pink Diamond') (votes 6 for, 3 against), from W. J. Whitaker, Esq., Pylewell Park, Lymington, Hants.

To *Rhododendron* 'Dot' (*R. 'Mrs. Lindsay Smith'* × *R. Fortunei*) (votes unanimous), from the Rt. Hon. Lord Swaythling, Townhill Park, West End, Southampton.

Other Exhibits.

Rhododendron 'Retrich' (*R. reticulatum* × *R. Weyrichii*), from Captain Collingwood Ingram, Benenden, Kent.

Rhododendron Fittianum, from S. J. Marsh, Esq., Ardens, Nutley, Sussex.

Rhododendron 'W. F. H.', *Rhododendron* 'W. F. H.' var. 'Roy' (*R. haematodes* × *R. 'Tally Ho'*), and *Rhododendron* species, from W. J. Whitaker, Esq., Pylewell Park, Lymington, Hants.

MAY 1, 1945.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

Malformation in Tulip 'William Copland.'—Mr. MOSLEY drew attention to a curious aberration in Tulip 'William Copland' which he had noticed in plants grown from large bulbs. The lowest leaf of the floral axis had curved over and become locked in the bulb so that the axis had been unable to develop normally. Attempts made here and in Holland to find the cause of the phenomenon had hitherto been unsuccessful, but it has been ascertained that it begins very early in the development of the bulb and apparently is complete before the bulb is lifted in summer.

Rhododendron stamineum series.—Lord ABERCONWAY sent a truss of a *Rhododendron* of the *Stamineum* series having white flowers tinged pink with a yellow blotch on the upper petal, with the information that it appeared to be the hardiest species of its group.

Curious Galanthus.—Mr. BOWLES showed fruits of a *Galanthus*, possibly a form of *G. Elwesii*, from Sir FREDERICK MOORE's garden in Dublin, three or four of which were borne upon a single scape. There may have been some amount of fascination but the scape was not evidently flattened. The peculiarity had persisted for several years. Each flower had had its spathe.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRETT, V.M.H., in the Chair, and twelve other members present.

The business on this occasion consisted of a discussion on (1) the forming of a Fruit Group, and (2) frost damage to fruit crops.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seven other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations and *Dianthus Allwoodii*.

Flora Medal.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

Other Exhibit.

Iceland Poppies, 'Aurora Strain,' from Messrs. Clarence Elliott, Ltd., Six Hills Nursery, Stevenage.

Slender spikes of the blue *Campanula Rapunculus* were already in bud ; it is quite a good biennial, 2 to 3 feet high. The tiny blue *Anagallis caerulea*, the blue Pimpernel, and the pink *Linum pubescens* were both growing on the cultivated terraces. Several *Salvias* were just coming into flower ; one of them, 18 inches to 2 feet high, had very dark red flowers ; it was probably *Salvia hierosolymitana*.

Higher up the hillside, above the terraces, low bushes of the white *Cistus salvifolius* and pink *C. villosa* were in bud. *Iris Sisyrinchium* was again most frequent by the paths and a solitary scarlet *Tulipa sharonensis* was wide open in the sunshine ; it is most commonly found in the sandy soil near the coast ; the brilliant flower usually has a very short stem except when it is drawn up among grass or herbage. The small bulb is an inch to a foot deep. Going downhill back to the road I passed a small tree of *Arbutus andrachne* in flower, and several of *Styrax officinalis*, whose creamy-white flowers, like Orange Blossom, hang down below the dark green leaves with tomentose lower surface ; it is a very fine shrub growing to about 18 feet.

In shady places a good white *Allium* was flowering, without the strong smell so well known in buses, taxis, etc., in the East. A tiny little yellowish-green *Gagea* was growing in the shallow on some large rocks, and wedged in crevices several clumps of *Pancratium parviflorum* had long, narrow leaves with a white midrib ; the white flowers in the autumn are followed by the leaves in winter.

Further on, *Crataegus Azarolus*, a stiff pubescent-leaved Hawthorn, was just coming out ; it has a strong scent and is not particularly attractive. Bushes of *Phlomis fruticosa*, Jerusalem Sage, were already in flower and continue till June. Huge handsome spikes of the Giant Fennel, *Ferula communis*, 6 to 9 feet high, towered above the surrounding plants. *Acanthus syriacus*, Bears Breech, was flowering under some Pines and also in the open.

Back on the road again, the bristly perennial squirting Cucumber, *Ecballium Elaterium*, was in bloom by the roadside ; in June the Cucumber-like fruits break off at the stalk and squirt their seeds several yards. On some damp rocks close by two kinds of ferns were growing, the tiny annual *Gymnogramma leptophylla* and an *Asplenium*, probably *A. fontanum*. On top of the rocks were some large Stone-crops which in June had spikes of greenish-yellow flowers about a foot high.

The most curious plant I found was an Asclepiad, *Boucerosia Aaronis*, a brownish-yellow fleshy, leafless plant, a few inches high, with the aspect of a *Stapelia* ; unfortunately it was not in flower ; it seemed rather out of place and lost among all these other plants. It is a relic of a tropical age.

Many other plants were growing in and around the forestry reserve, all of them close to the main road ; some I could not identify, others were of no particular merit. In spite of the warm weather some of the smaller flowers which I took back in a tin lasted for more than a week. Later on, in May and June, I was able to collect some seeds and bulbs to send home. As in many other parts of the world, many of the best flowers grow close to good motor roads ; perhaps fortunately, only a very few people stop to look for them. Passing this pleasant spot at the end of November, I could see from the bus many patches of *Colchicum Steveni* ; its tiny pink flowers come out with the leaves which are nearly as narrow as those of a *Crocus*. No doubt *Crocus hyemalis*, equally common in the Judæan hills, was there too.

A CHLOROSIS OF TOMATOES IN RELATION TO POTASSIUM - AND MAGNESIUM NUTRITION.

By THOMAS WALSH, Ph.D., M.Agr.Sc., and EDWARD J. CLARKE,
B.Agr.Sc. (Hort.) (University College, Dublin).

DURING the past few years a premature yellowing of the bottom leaves of Tomato plants has become very familiar to many Irish Tomato growers. From horticultural literature it would appear that this condition is also widely distributed in Tomato crops in Great Britain. As some factors concerned with the development and control of this chlorosis have been investigated by us, it was thought desirable to present a general account of our findings, more detailed reports having been presented elsewhere (3, 4).

The outstanding fact so far revealed is that this condition is due to an insufficient supply of magnesium within the plant. As the effect of a deficiency of this nutrient in Tomato foliage has been pictured by WALLACE (2) and described fully elsewhere (3), only a brief account of the symptoms manifested is included here.

The first indication of the onset of this chlorosis is the presence of yellow-green areas on the central portion of the lamina adjacent to the midrib. These areas gradually become more defined and yellowed, eventually covering the whole leaf when the attack is severe, though even then the margin of the leaflets may remain green for a considerable time. While the interveinal tissue is thus affected the midrib and its subsidiaries remain green, thus giving affected plants a characteristic and easily recognized appearance. This chlorosis, which usually appears in the fourth or fifth leaf from the bottom of the plant, extends upwards as the season advances and when severe affects practically the whole plant with the exception of the topmost leaves.

This chlorosis should not be confused with that due to iron deficiency, which is reflected in a marbling or mottling of the topmost leaves arising from an interveinal yellowing. Incidentally, the latter condition, which is present to a considerable extent under commercial conditions, has been successfully controlled by us by the application of a 0.5 per cent. solution of iron sulphate (ferrous salt) in the form of a spray applied to the tops, a repetition of the spray at frequent intervals being necessary, as the iron is immobilized in the leaves on to which it is sprayed. When severe, iron chlorosis results in the development of spindly tops and consequent bad finish, the fruit being a whitish-green colour in the immature state.

Account of Experiments.—The results of the first series of experiments and observations (3) showed that this magnesium chlorosis was intimately associated with the potassium nutrition of the plant, being induced where a high level of potassic manuring was practised. All the soils carrying chlorotic crops were shown to contain a very high quantity of easily available potassium in addition to being plentifully supplied with the other essential nutrients. No evidence was forthcoming of a differential behaviour of varieties to susceptibility, and the condition was not found to be associated with the degree of soil acidity. Sprays and top-dressings of iron and manganese sulphates produced no effect. From leaf analyses it was observed that in every instance the chlorosis was associated with a high potassium content and a lowering in the ash content of the leaves.

These experiments were brought a stage further in 1943, when particular attention was paid to the effect of potassium on the uptake of magnesium. A sand-peat medium was employed, the peat carrying a moderate quantity of easily available magnesium and a very small amount of potash and other nutrients. To this medium, lime, sodium, chlorine, phosphate and nitrogen were added in a quantity sufficient for maximum growth, the two latter being added in the form of base, and top-dressings at frequent intervals. In addition small quantities of copper, zinc, boron and manganese were added. Three levels of potassic manuring, low, medium and high, were employed, magnesium being also added in some instances in moderate and high amounts, the status of the peat in this latter connection being regarded as low. In both cases the sulphates, *i.e.* potassium sulphate and magnesium sulphate, were used. In one series of treatments no sulphur was added, a comparison as to the effect of this element being therefore possible with the other series. In another the level of calcium nutrition was considerably lowered, while in further series the level of sodium and aluminium was varied. In all eleven treatments were adopted.

At no time during the season did chlorosis appear in the plants maintained at a low or medium level of potassium or a high level of magnesium. In all but one instance the high potassium-low magnesium plants showed severe chlorosis. The exception was that series of plants maintained at a low level of sulphur, and while the disorder did appear in this instance, its onset was delayed by over a month and was not at any time so severe as in the other comparable series. A variation in the level of calcium nutrition in this experiment did not appear to affect the onset of the chlorosis. Other observations on plant and crop behaviour together with the analysis of the lower and upper leaves, and the fruit from each plant, provided some further interesting information.

Plant Vigour.—The best plants were those grown at a medium level of potassium nutrition. Moreover, all the plants in this case were equally vigorous, while in the high potassium series, even where the chlorosis was controlled, plants within the series varied considerably in size and weight, many plants being quite "spindly." Of the medium potassium plants, the least vigorous were those highly manured with magnesium sulphate. An interesting feature of the plant vigour returns was the vigorous growth of the high potassium-low magnesium-low sulphur plants, this effect being obvious throughout the season.

At the low level of potassium nutrition there was, as might be expected, a considerable reduction in plant vigour accompanied by severe potash deficiency symptoms. An interesting feature of the latter lay in the fact that the severity of these symptoms was much accentuated in the low potassium-high magnesium series.

Fruit.—With two exceptions—the low potassium and no added sodium series—fruit development as measured in 10-day periods throughout the cropping season was uniform. In the series named, retardation took place. At the high level of potassium nutrition there was on the whole a considerable reduction in the size of fruit. Thus, while the average weight of single fruit from the high potassium-low magnesium series and high potassium-high magnesium series was 1.5 and 1.3 oz. respectively, that from the medium potassium-low magnesium and medium potassium-medium magnesium plants was 1.9 oz., while at the medium potassium-high magnesium level a

reduction to 1.6 oz. ensued. On the average also highest yield accrued from the medium potassium plants, those at the medium potassium-low magnesium level being particularly outstanding.

Considerable inter-series differences in fruit colour were also evident. The fruit of high potassium plants showed an intense dark-green colour when immature and deep red pigmentation when ripe, this effect being particularly evident in the low calcium series. While the fruit of medium potassium plants were a normal colour, those of the low potash plants were a pale red.

Leaf and Fruit Composition.—The outstanding feature of the analysis of both upper and lower leaves was a depression in magnesium content at the high level of potassic manuring. The extent of this depression may be judged from the fact that the average magnesium content of the foliage of plants from the low magnesium-low potassium series was 0.78 per cent., while that of the high potassium-low magnesium series was 0.25 per cent. Even at a high level of magnesium nutrition its uptake was considerably depressed at the high potassium level, as shown by the fact that the average magnesium content of the foliage of high potassium-high magnesium plants was 0.57 per cent., while that of the low potassium-high magnesium plants was 1.0 per cent.

Another relationship of primary importance revealed by the results was, that it was the ratio of potassium to magnesium in the foliage rather than the actual quantities of those elements present which appeared to be of importance in determining the severity of the chlorosis. This point is amply illustrated in the following table, where the symbols K and Mg are respectively used for potassium and magnesium, and L, M and H for low, medium and high in series designation. The extent of chlorosis is indicated as follows: Very Severe × × × × ×, Moderately Severe × × ×, Nil 0.

Series.	Per cent K.		Per cent. Mg.		K/Mg ratio.		Chlorosis.
	Lower Leaves.	Upper Leaves.	Lower Leaves.	Upper Leaves.	Lower Leaves.	Upper Leaves.	
L K-H Mg . .	1.38	0.92	1.14	0.85	1.2	1.1	0
L K-L Mg . .	0.99	0.95	0.90	0.65	1.1	1.5	0
H K-H Mg . .	4.69	6.31	0.74	0.40	6.3	15.9	0
H K-L Mg . .	5.12	5.69	0.30	0.19	16.8	30.8	× × × × ×
M K-H Mg . .	3.21	3.92	0.92	0.36	3.5	11.2	0
M K-L Mg . .	4.45	4.20	0.58	0.25	7.7	17.1	0
M K-M Mg . .	4.47	5.47	0.58	0.36	7.7	13.8	0
H K-L Mg-L S .	5.55	5.64	0.39	0.26	14.4	21.4	× × ×
H K-L Mg-L Ca .	6.38	6.93	0.34	1.19	18.4	36.5	× × × × ×
H K-H Mg-L Ca .	8.36	7.65	0.51	0.39	16.4	19.6	0
H K-L Mg-L Na .	6.27	6.85	0.29	0.23	21.9	32.0	× × × × ×
H K-L Mg-H Al .	7.82	8.14	0.20	0.27	39.7	33.1	× × × × ×

The fruit analyses revealed the fact that, where magnesium was concerned, a deficiency of this element in the foliage was not reflected in the amount present in the fruit. At the high level of potassium nutrition the amount of magnesium in the fruit was in general slightly higher than that present at the low and medium level. It would appear, therefore, that the demands for magnesium made by the fruit are satisfied at the expense of the leaves. The development of the chlorosis is not, however, due to an increased utilization of magnesium by high potassium plants, as when the vigour of plants and yield of

fruit are related to chemical composition it can be seen that least magnesium was used by the high potassium plants. There is no doubt from the analytical results, however, that the main factor influencing the onset of this condition is a considerable depression in magnesium uptake under the influence of high potassic manuring.

Another interesting feature of the results is the higher magnesium content of the plants maintained at a low level of sulphur and a high plane of potassium nutrition. This was reflected in the delay in the onset of chlorosis in these plants where, as previously noted, it was but of a moderately severe order. This aspect of magnesium deficiency has also been investigated for some other plants since, and appears to be of general application. Under commercial conditions where normally considerable quantities of sulphur are applied in potassium sulphate, its importance can also be appreciated. In passing it is worth noting that where an accentuation of potassium deficiency was noted in the low potassium-high magnesium plants, this appeared to be associated not with a lowering of the potassium content but of the sodium content of these plants. Sodium is now known to fulfil certain functions in plant development normally attributed to potassium, and the above appears to be an illustration of this.

1944 *Experiment*.—As the application of magnesium sulphate is commonly recommended as a control for magnesium deficiency, and as the results so far obtained showed that, even when applied in high quantity, the operation of the depression of uptake effect under the influence of high potassium reduced to a marked extent the magnesium content of the foliage, it was considered desirable to see at what rate of magnesium manuring best control was obtained. This experiment was carried out in a manner similar to those previously described, the same level of nutrition with regard to all the nutrients except potash and magnesium being maintained. A high level of potassic manuring was adopted, while six levels of magnesium nutrition were followed in six series, *i.e.* 1, 2, 3, 4, 5 and 6; the following quantities (in grammes) of magnesium sulphate being respectively applied per pot, 0, 2½, 5, 10, 20, and 40. As the medium used was of the same nature as that employed previously, there was sufficient magnesium present without further addition, to support a vigorous Tomato crop at a moderate rate of potassic manuring. All the magnesium was applied as a base dressing, the potash, nitrogen and phosphates being applied in base and top dressings.

Observations made throughout the season showed a distinct inter-series variation in the severity of chlorosis. The first symptoms appeared at a time when a total of 52 grm. per plant of potassium sulphate had been applied. Plants in series 1 and 2 showed severe to very severe chlorosis; those in 3, somewhat less severe; while the plants in series 4, 5, and 6 provided a marked contrast through their general greenness in colour, though even in series 6 slight symptoms of magnesium deficiency were evident. The most vigorous series of plants was 5, where one plant showed a moderate attack of chlorosis.

This result would appear to show that the addition of 10 grm. of magnesium sulphate per plant was sufficient to ensure a reasonable control, though even where 40 grm. was applied control was not complete. This is an ample substantiation of the analytical results with regard to the depression in magnesium uptake by potash. The actual amount necessary would, of course, vary with a variation in the potash status of the nutrient medium or soil.

Aspects of Control Measures.—As a result of the experiments carried out it appears logical to conclude that the best way to control this form of magnesium deficiency, *i.e.* that induced by high dressings of potash, lies not in the application of magnesium sulphate but in the ordered use of potassic fertilizers and other materials carrying this nutrient. To date, an examination of soil samples from a considerable number of Tomato houses where this condition is severe has shown in every case the presence of conditions, as far as potash status is concerned, conducive to its development. All these soils have shown an extra high quantity of available potash, about 0.1 per cent. or the equivalent of 30–40 cwt. per acre of potassium sulphate being an average figure, while in no case has the magnesium status been less than a medium level. The latter, as remarked previously, is sufficient to ensure an excellent crop at a moderate level of potassium. Not only has potash in such quantity been found to be present in the surface soil, but also to a depth of over 3 feet. Incidentally this latter fact has an important practical bearing since some growers refute the contention that high potash could be the cause when resoiling to a depth of 9 inches had taken place. In such cases it was found that during digging operations subsequent to resoiling, the fresh soil had been mixed with the high potash-containing subsoil.

That such a position exists with regard to the potash status of many Tomato house soils is no doubt due to the cumulative residual effect from the application of this nutrient. In this connection it is important to note that usual recommendations with regard to the use of potash fertilizers were followed. Consequently, if this chlorosis and its attendant evils are to be controlled, and if a proper nutrient balance is to be maintained in soil continuously cropped with Tomatoes, a considerable modification in present recommendations where the use of potash is concerned will be necessary. In this latter connection it might be remarked that the recent work of CLARKE (1) provides a useful indication as to the procedure likely to yield satisfactory results. Under commercial conditions where the chlorosis was originally very severe and where the potash status of the soil was classed as extra high, considerable control has been obtained by the non-application of potash during the past two cropping seasons. The obtaining of control in this way was coincident with a much increased yield, the result of increased vigour.

It might be argued that the application of magnesium sulphate would appear to be the logical method of control. When it is considered, however, that relatively large dressings of this salt (depending on the potash status of the soil) may be necessary to achieve this, and that such additional application of salts to the soil is undesirable from a number of aspects, the reason for our approach to obtaining control is seen. It has been shown that even where the chlorosis was controlled at a high level of potassium a considerable decrease in size, yield and quality of fruit took place. At such a level of nutrition also it has been shown (5) that conditions are very suitable for the development of blossom-end rot in the fruit, as a result of the effect of the accompanying increase in salt concentration on the osmotic pressure of the soil solution, the latter to a considerable extent determining the availability of water to the plant. From some studies we have made on the effect of a high level of manuring on root injury, both under experimental and practical conditions, considerable evidence has been forthcoming to show that much of the root trouble

normally encountered by Tomato growers may in reality be primarily due to salt injury. In this connection it is interesting to note that what is considered the most potent organism in causing root rot under Irish conditions, *Colletotrichum atramentarium*, is in fact but a weak parasite, and consequently salt injury to the cortex of the roots, which of itself can result in the development of root rot symptoms, should considerably facilitate the activities of this organism. Does it not seem significant also that it is only after a number of seasons severe injury due to root rot generally occurs, even though the considered causative organisms are in the soil all the time, and that this increase in tendency towards injury is coincident with an increase in salt concentration? The extent to which the latter takes place can be more easily realized when it is stated that specific resistance determination for a number of Tomato house soils was in the region of 700–1,000 ohms, a like determination for a normal agricultural soil being generally in the region of 10,000 to 30,000 ohms.

Consequently it can be seen that a further increase in salt concentration in Tomato house soil through the application of magnesium sulphate to control this chlorosis is undesirable. A reduction of the potash status to a lower level is, however, very desirable, and this achieved through cropping, without the further application of potash, eventually leads to a proper balance between potassium and magnesium in the soil. This latter procedure will also, of course, result in a lowering of the sulphur status, the desirability of which in controlling the chlorosis has been previously indicated.

In conclusion it may be remarked that this effect of potassium relative to magnesium has now been studied both in pot experiments and under field conditions for a number of other crops and a detailed report is being prepared. This study has shown that Potatoes, Mangolds, Sugar Beet, Apples, Swedes, Tobacco, Turnips, and to a less extent cereals show a similar reaction to that discussed to high potassic manuring, viz. the development of symptoms of magnesium deficiency. Indeed the only instances of magnesium deficiency in plants so far identified in this country have all developed under a high level of potash in the soil. This latter condition, it is worth noting, obtains in many old garden soils, and the development of infertility in these where certain crops, particularly Potatoes, Brassicas and Apples, are concerned would appear to be closely related to the factors discussed in the foregoing.

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SPECIMEN ORCHIDS.

By E. R. ASHTON.

RESEARCH into the older records of the Society's activities in its former home at South Kensington reveals alluring accounts of wonderful specimen Orchids of phenomenal size that were frequently exhibited at their shows, and regret is sometimes felt that these outstanding manifestations of horticultural skill are now so rarely seen, and that their cultivation has fallen so largely into abeyance. That the bold specimen plant is pleasing to the eye and fulfils a definite purpose in the ordered scheme of floral decoration will be readily granted, and as an example and incentive to cultural skill it deserves every encouragement. At the present time this concentration of effort on the careful cultivation of a limited number of large plants has been largely superseded by numerous small and frequently subdivided single growths, the product of the hand-fertilizing of selected forms of outstanding merit, in the effort to improve on the somewhat indiscriminate mating of nature.

In the cultivation of these large specimen Orchids under artificial conditions nature has imposed certain limitations, and the choice of the more free-growing species holds out the greatest promise of success. The importation of outsize plants collected in their native habitat having virtually ceased, it becomes necessary to select certain species, which from comparatively small plants will by natural increase quickly attain to large dimensions. Such species as *Lycaste*, *Phaius*, *Cymbidium*, *Platyclinis*, *Ada*, *Coelogyne*, *Brassia verrucosa* and *Epidendrum prismatocarpum* may be attempted with reasonable chance of success, but with rare exceptions the popular *Odontoglossums* and *Cattleyas* will be found unsuitable. The terrestrial *Cypripediums* will, however, yield useful results. In view of the very free drainage to which these large plants are subjected in the native habitat, it will be realized that the main difficulty consists in reproducing these conditions under artificial cultivation. The necessity of severely limiting the amount of compost employed is of the first importance in order to facilitate the speedy drying out of the material, as anything approaching a close sodden condition will inevitably lead to loss of roots and progressive debility. These favourable conditions are best attained by the use of a hard osmunda fibre when obtainable, or one of the fairly efficient wartime substitutes which are now available, with the usual additions of loam fibre, moss and half-decayed leaves, to suit the special requirements, a liberal quantity of finely crushed crocks and charcoal being added as the work proceeds to facilitate a due aeration of the root system. This growing scarcity of potting fibres, formerly obtained mainly from the United States and Japan, has led recently to a reversion to the old-time use of well-sifted peat fibre. This, together with the addition of equal parts of half-decayed oak or beech leaves, and sphagnum moss, if tightly packed, has proved to be an efficient substitute for more orthodox methods. Several forms of Welsh root fibres are also obtainable in limited quantities.

To ensure efficient drainage, it is advisable to place an inverted pan of a suitable size over the plentiful supply of crocks in order to avoid the use of a large mass of material in the centre and to facilitate the drying out of the compost. Every effort should be made to compress the fibre as tightly as possible in the centre, and not merely

round the edges of the pan, using strong pressure from the sides inwards. The importance of a thin layer of compost over abundant drainage material should be constantly borne in mind, as a healthy plant will root freely into the crocks and apparently appreciates the moist well-aerated conditions found there.

In course of time it is inevitable that the centre of a large plant should become bare and unfurnished and the compost decayed. It is sometimes possible to remove some of the old leafless bulbs or, where there are sound eyes at their base, to cut through the rhizome in front of them in order to stimulate new growths and by adding fresh compost to refurnish the bare centre. Care should be taken to secure them in position by means of a stake to which at least one growth is firmly tied. With species like the well-known *Coelogyne cristata* with small creeping rhizomes, stout wooden pegs will hold the detached pieces securely in position until good root-hold is ensured. When these methods cannot be carried out, it is advisable to break up the plant into several large pieces, and, having removed the decayed centre and useless pseudo-bulbs, to reassemble the divided portions, taking care that some of the young growths are pointing inwards. Alternatively, each large severed piece may be potted up separately and, with free growing species, several large plants will be rapidly produced. When decay has become more extensive, it will be necessary to break up the plant into a number of small pieces and to pot each portion separately into the smallest pot possible until health is restored. Subsequently these divided portions may be reassembled to any number required, and a large specimen restored. This method is preferable to replacing a number of small detached pieces together in one large receptacle, which is rarely successful. A treatment that has met with some success as a temporary measure in dealing with large old specimens of *Coelogyne cristata* and similar species until some degree of health is restored, is to prepare a mixture of the finer portions of the potting fibres mixed liberally with crushed crocks, charcoal, half-decayed oak leaves and coarse sand. This is sifted freely over the plant and well washed in, the process being repeated until all vacant spaces are well filled and desirable nourishment supplied.

In the elusive problem of watering, on which so much of the success of Orchid cultivation consists, the method of procedure should be approached with the greatest care, and moderation should be the guiding principle. The natural tendency with large specimens is to pour water into the centres, but seeing that the principal difficulty is drying out this portion of the compost, this method should be kept severely in check. If the material is reasonably moist at the time of potting, some weeks, even months, according to the season, may be allowed to pass without further application of water, beyond a light spraying overhead on bright days. A large plant of a free-growing *Odontoglossum* that was reassembled last October has not yet (February) received any water, beyond a light spray overhead, and has obviously benefited by the process. The slightly dryer conditions will encourage the plant to throw out roots for its own support, and when this action again becomes visible a light application of water round the sides of the pot, where most of the live roots are found, will prove sufficient. A slight shrivelling of the plant, which sometimes occurs after re-potting, only means that it is drawing on that interesting provision of nature, the thickened stem or pseudo-bulb, which enables it to tide over the dry season in its native habitat and is soon replenished. On the other hand, a shrivelling due to excess of moisture and

consequent loss of roots is to be avoided carefully, as further applications will only aggravate the evil, and no great improvement can be expected until new roots have been formed. In later stages, if the size and inaccessibility of the plant does not prevent, the one infallible guide of weight should be followed and the pot lifted; water being withheld from a heavy sodden plant. A position in the house with an all round lighting is advisable to prevent the plant becoming one-sided. Otherwise it will be necessary to turn the specimen at frequent intervals. Careful staking of the advancing spikes of bloom should be undertaken in good time to form a well-balanced display and a close watch on insect pests observed.

(Illustrations Figs. 65 to 69.)

A NOTE ON CAMELLIAS.

IN the first half of the eighteenth century Lord PETRE introduced *Camellia japonica* (1739).

In the first half of the nineteenth century *C. Sasanqua* in 1811, *C. malifolia* in 1816, *C. oleifera* in 1820 (perhaps a re-introduction), and *C. reticulata* in 1824, all reached England from China.

In the first half of the twentieth century from the same great source of good plants there came *C. cuspidata* and *C. saluenensis*.

The first two plants of *C. japonica* were planted in a stove and soon died; later attempts to grow it in a cooler atmosphere were more successful. The end of the eighteenth century and the years following saw the introduction of several varieties from China and the raising of new ones here, especially in the great nurseries of Messrs. CHANDLER at Vauxhall and of Messrs. LODDIGES at Hackney. These novelties brought *Camellia japonica* into favour as a greenhouse and conservatory plant of the first order. A few bolder spirits planted their Camellias outdoors, but their hardiness has never been fully recognized, and partly because of this, but possibly also because the severe formal shape which the florists endeavoured to secure in their selected seedlings was little to the taste of the succeeding age, the growing of Camellias declined until it was unusual to find young plants in our nurseries. Yet these Camellias are so beautiful in flower and in foliage that they are among the best shrubs that have ever come to our land. When Mr. G. F. WILSON made the wild garden at Wisley he planted several Camellias in an open space in the wood and arranged to give them winter protection by an overhead covering. Forty years ago they were moved to other sites in the wood and no longer had any but the natural protection afforded by the surrounding Oaks and Birches. Never once since then have the bushes themselves been damaged by frost, though sometimes the flowers have suffered in spring, and sometimes buds have fallen prematurely, though it is doubtful whether this can be attributed to cold. The winter climate of Wisley is a severe test of hardiness and they have come through it well.

Hardy as they are, and beautiful as they are at all times, yet the twentieth century has brought something better in the way of Camellias than they, and these we owe to that great gardener, Mr. J. C. WILLIAMS of Caerhays Castle, Cornwall, through whom so many good plants have been introduced from China and made at home in England.

He raised many seedlings of *C. saluenensis* from seed collected in China by Mr. GEORGE FORREST, and in his garden crosses were made between some of the best of these seedlings and varieties of *C. japonica*. Many of these hybrids were raised, grown on, and tested, and two of them have been selected and named.

They have already been referred to in our JOURNAL : first, in 1940, by Lord ABERCONWAY, in vol. 65, p. 217, with a figure of a well-flowered plant on a terrace wall ; next, when they obtained awards in 1942, in vol. 67, p. 210, with a figure of a flowering shoot ; and again, in 1943, by the Bishop of Truro in vol. 68, p. 43. The years that have passed have proved the praises they there received to have been fully justified.

To give them their official names, they are *Camellia* (*C. japonica* × *C. saluenensis*) ' J. C. Williams,' and *C. (C. japonica* × *C. saluenensis*) ' Mary Christian.' Both are very hardy, standing severe frosts without injury to bush or flower-bud, both flower freely and open their flowers in succession over a long period from February to April, both can be raised easily from cuttings, grow rapidly and make shapely bushes with pleasant, evergreen foliage. They have, in fact, all the attributes of a good garden shrub fitted for English gardens and they will for long years to come be worthy reminders of those in whose garden they were raised, Mr. J. C. WILLIAMS and his wife, whose names they bear.

Camellia × ' J. C. Williams,' as it will no doubt be spoken of, has Phlox-pink flowers 4 inches across with 6 to 8 petals opening flat or somewhat recurving. *C. × ' Mary Christian '* has flowers of a darker shade of Phlox-pink, at first cup-shaped but becoming flatter and about 3½ inches across.

F. J. CHITTENDEN.

NOTE ON BLIGHT OF OUTDOOR TOMATOES.

By D. E. GREEN, Wisley, and C. T. THOMAS, Glamorgan Farm School, Neath.

FOR several years the Royal Horticultural Society's Laboratory at Wisley has been interested in Blight disease of outdoor Tomatoes which is caused by *Phytophthora infestans*, the Potato Blight fungus. In 1940 the loss of sources of imported Tomatoes and the probable increase of outdoor Tomato cultivation in this country made it necessary to devote special attention to this disease. Experiments have been carried out to increase our knowledge of the best methods of controlling the trouble and some results have already been published (1, 2). As a result of those experiments, the general conclusions arrived at were (a) that spraying of outdoor Tomatoes against Blight is advisable every season in this country as a routine operation ; (b) that the most efficient sprays to use are copper-containing ones ; (c) that some copper sprays, if used more than once, tend to leave a deposit on the fruit.

In the experiments mentioned above the so-called colloidal copper sprays were favoured because they left no deposit on the fruit even after several applications. Bordeaux mixture (4-6-50 formula) and to a less extent Burgundy mixture (4-5-50) left a deposit on the fruit after two applications, and Burgundy mixture in particular was inclined to scorch the younger foliage. In addition, at least two of the colloidal

copper sprays used gave better control of the disease than did Bordeaux or Burgundy mixture freshly made up. When these copper-containing sprays were applied at the right time, one good application gave good control of Blight at Wisley. The time of application was judged to be when most of the plants had been "stopped" after the setting of the fourth truss, which in Surrey was some time in early August. Even in a bad Blight season, such as 1941, the results justified the view that one good application of a copper-containing spray was sufficient to control Blight and to give adequate protection to all the fruits likely to be picked ripe from the plants. Protection of the top fruits likely to be picked green and ripened indoors may require a second light spraying over the tops at a later date.

While this treatment was considered suitable for the South-Eastern counties generally, it was considered probable that in western counties one spray application would not be sufficient. This has been confirmed by experience gained in western districts and especially South Wales, which indicated that one spraying was obviously not sufficient to avoid loss from Blight infection.

An experiment was therefore arranged in 1944 in which trial plots of Tomatoes (interplanted with Potatoes) were set up at Wisley and duplicated at the Glamorgan Farm School, Neath, South Wales. The plots were small (six plants in each) but were designed so as to obtain information on the number of spray applications required and the best times to apply them in order to get efficient control of Tomato Blight.

As Blight was so late in appearing in 1944, the plots at Wisley yielded no results because Blight had not appeared on the Tomatoes before an early frost killed the foliage. On the other hand, in South Wales, Blight as usual was fairly severe and some interesting data were obtained. The purpose of this note is to record the results of the experiment for the information of growers in western areas.

As already stated, the trial plots were interplanted with Potatoes to encourage infection by Blight. The sprays used were Bordeaux mixture (made from a proprietary paste) and a selected colloidal copper spray which had been found very effective in previous years. Saponin was added to each as a spreader. These two sprays were applied at four different times, viz: July 15, July 30, August 12, and August 27. The plots (six plants each) were arranged so that each received varying numbers of spray applications and the date of the first application also varied for different plots, as follows:—

- 1 Sprayed once, July 15.
- 2 " " July 30.
- 3 " " August 12.
- 4 " " August 27.
- 5 " twice, July 15 and July 30.
- 6 " " July 30 and August 12.
- 7 " " August 12 and August 27.
- 8 " three times, July 15, July 30, August 12.
- 9 " " " July 30, August 12, August 27.
- 10 " four times, July 15, July 30, August 12, August 27.
- 11 Unsprayed, control plot.

One series treated with Bordeaux and one with colloidal copper spray. The surrounding Potatoes left unsprayed.

If the dates of the four spray applications are represented by the

numbers 1, 2, 3 and 4, each plot can be referred to by the numbers corresponding to its spray treatment, *e.g.* Plot 2 and 3 = plot sprayed on July 30 and August 12.

The variety used was 'Market King' planted May 14 on ground which had previously received compost (Adco treated) forked in and a dressing of sulphate of potash and superphosphate. Most of the plants had been "stopped" by July 29 after the fourth truss. Blight was suspected as being present on Potatoes in the vicinity by mid-July, but was not obvious on the Tomato foliage until about September 10, when the unsprayed plots showed fairly general infection. Picking was done on five dates, *viz.* September 10, September 16, September 23, September 30 and October 7, all remaining fruits of any size being picked on the last date. Table I shows the total number of fruits picked from the different plots during the season and the percentage affected with Blight.

TABLE I.

Plot Sprayings.	Sprayed with Bordeaux.		Sprayed with Colloidal Copper.	
	Total fruits picked.	Percentage diseased.	Total fruits picked.	Percentage diseased.
Spray 1 (July 15) . . .	337	18.1	320	30.3
" 2 (July 30) . . .	229	19.6	211	17.5
" 3 (August 12) . . .	166	17.5	212	8.0
" 4 (August 27) . . .	199	21.6	306	10.4
" 1 and 2 . . .	146	35.6	248	9.6
" 2 and 3 . . .	145	5.5	168	1.8
" 3 and 4 . . .	255	10.9	175	2.3
" 1, 2 and 3. . .	173	7.9	264	1.7
" 2, 3 and 4. . .	180	6.9	180	1.1
" 1, 2, 3 and 4 . . .	107	6.5	165	1.2
Control (unsprayed) . .	286	61.5	255	36.8

CONCLUSIONS.

Although this test can only be considered small, the differences in the results obtained from the different plots are worthy of consideration. It will be seen at once that the control given by the colloidal copper spray was better than that obtained by using Bordeaux, although it must be said that the latter was not home-made, and for some reason infection seemed to be heavier in the Bordeaux series of plots. Nevertheless, this result agrees with similar previous experiments at Wisley (see *R.H.S. Journal*, 68, 1943), in which certain proprietary colloidal copper compounds gave better results than fresh home-made Bordeaux mixture. It is obvious, however, that some kind of spray treatment to guard outdoor Tomatoes against Blight disease is essential in our climate, because 1944 could not be considered a bad Blight season, yet the unsprayed control plots both suffered severely (36.8 and 61.5 per cent. of their fruits blighted). In the case of the plots sprayed once on different dates, there is an obvious reduction of infection, the apparent best date being No. 3 on August 12, but the loss of fruit in every case is still too heavy. Of the plots sprayed twice, the poorest result was obtained with those which received the first two sprayings only, *i.e.* 1 and 2 on July 15 and 30. The other twice sprayed plots, as well as those sprayed three and four times, were good and in the

series treated with colloidal copper the number of fruits lost through Blight was in all cases except one less than 2 per cent. The exception was in the plot sprayed with colloidal copper on the last two spraying dates, August 12 and 27, and even here the loss was only 2.3 per cent.

When it is remembered that 1944 was not a serious year for Blight, it would appear from these results that in western districts two sprayings are necessary to protect outdoor Tomatoes. The earlier sprayings were not so effective and the second and third appeared to be the best combination in 1944. It will be noticed in the case of Bordeaux mixture as well as Colloidal Copper that the plots treated with both the second and third sprayings (*i.e.* Nos. 2 and 3), or any which include these two, gave the best results and reduced the losses of fruit to a very small figure indeed. The dates of these effective sprayings (July 30 and August 12) appear rather late for western areas, and possibly this is explained by the delayed appearance of Blight in this area last year. In Surrey the usual time advised for the first (and only) spraying is the first week in August and it is unfortunate that the duplicate experiment at Wisley failed to yield any information in 1944. Nevertheless, it seems clear that in the west two sprayings are advisable for protecting outdoor Tomatoes against Blight disease.

REFERENCES.

- (1) "Outdoor Tomatoes at Wisley." *R.H.S. Journ.*, 66, 1941, p. 445.
- (2) GREEN, D. E., and ASHWORTH, D.: "Blight of Outdoor Tomatoes." *R.H.S. Journ.*, 68, 1943, p. 179.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Carnation 'Kathleen Stevens.' A.M. April 17, 1945, as a perpetual-flowering variety, suitable for exhibition and market. Plant of vigorous growth, producing a succession of flowers on good stiff stems. Flowers $3\frac{3}{4}$ inches diameter, of good shape, full centred, a shade of light mauve-pink; margins of petals serrated; calyx strong. Raised by Mr. G. E. Dance of Warfield, and shown by Messrs. Biddlecombe Bros., Moss End Nurseries, Bracknell, Berks. See p. xxxv.

Laeliocattleya × 'Resolute' var. 'Rapture.' F.C.C. April 17, 1945. This vigorous plant bore a spike of 4 large and well-formed flowers of soft rosy-mauve colour, the expansive labellum having a rich purple front and a yellow throat. The result of crossing *Lc.* 'Mrs. Willoughby Pemberton' with *Lc.* 'Aphrodite.' Raised and exhibited by H. W. B. Schröder, Esq., Dell Park, Englefield Green, Surrey. See p. xxxv.

Narcissus 'Alamein.' A.M. March 20, 1945. A neat *Incomparabilis* variety (Division 2A) with a flower 4 inches in diameter, well poised on a 17-inch stem. The smooth canary-yellow (H.C.C. 2) perianth segments were of good substance, the outer ones $1\frac{1}{4}$ inch long and about $1\frac{1}{2}$ inch broad. The rather small, cup-shaped, marigold-orange (H.C.C. 11) corona was $\frac{7}{8}$ inch long and about 1 inch in diameter at its indented margin. Raised and shown by Mr. J. L. Richardson. See p. xxxii.

Narcissus 'Armada.' A.M. March 20, 1945. A well-formed *Incomparabilis* variety (Division 2A) with a flower $4\frac{1}{2}$ inches in diameter, well poised on an 18-inch stem. The canary-yellow (H.C.C. 2) perianth segments were smooth and overlapping, the outer ones being $1\frac{1}{4}$ inch long and about as broad. The orpiment-orange (H.C.C. 10)

cup-shaped corona was 1 inch long and about $1\frac{3}{4}$ inch in diameter at its frilled and expanded mouth. Raised and shown by Mr. Guy L. Wilson, Broughshane, Co. Antrim. See p. xxxii.

Narcissus 'Foresight.' A.M. March 20, 1945. An attractive bicolor trumpet variety (Division 1C) with a flower 4 inches in diameter, well poised on a 16-inch stem. The amber-white perianth segments were rounded and smooth, the outer ones being $1\frac{1}{16}$ inch long and nearly as broad. The neat, mimosa-yellow (H.C.C. 602) corona, which was reflexed and indented at the margin, was about $1\frac{3}{4}$ inch long and approximately the same across the mouth. Raised and shown by Mr. Guy L. Wilson. See p. xxxii.

Narcissus 'Krakatoa.' A.M. March 20, 1945. A striking Incomparabilis variety (Division 2A) with a flower $4\frac{1}{2}$ inches in diameter, well poised on an 18-inch stem. The canary-yellow (H.C.C. 2) perianth segments were smooth, the outer ones $1\frac{7}{8}$ inch long and about $1\frac{1}{2}$ inch broad. The telling orpiment-orange (H.C.C. 10) corona was $1\frac{1}{4}$ inch long and exceptionally broad, being $1\frac{7}{8}$ inch in diameter at the indented margin. Raised and shown by Mr. J. L. Richardson. See p. xxxii.

Narcissus 'Molna.' A.M. April 17, 1945, as a variety for exhibition. A very attractive variety, classified as a Leedsii (Division IVb), although the colour in the corona is deeper than "pink or apricot," with a flower about $3\frac{3}{4}$ inches in diameter, well poised on a 20-inch stem. The sulphury-white perianth segments were smooth, rounded and overlapping, the outer ones being $1\frac{3}{4}$ inch long and about as broad. The bowl-shaped corona, which was $\frac{1}{2}$ inch long and about $1\frac{5}{8}$ inch in diameter, was white tinged with yellow, greenish at the centre, and edged with Saturn-red (H.C.C. 13 and 13/1) at its crimped margin. Raised in Tasmania by Mr. C. E. Radcliff and shown by Mr. Guy L. Wilson. See p. xxxv.

Primula Allionii 'Apple Blossom.' A.M. March 20, 1945. A very attractive seedling raised by the exhibitor. It is a free-flowering plant with large, crimped flowers of light mauve (H.C.C. 633/2). Exhibited by Frank Barker, Esq., Onosma, Fairview Road, Stevenage. See p. xxxi.

Primula marginata 'Hyacinthia.' A.M. March 20, 1945. This is a vigorous seedling, possibly a hybrid, of *P. marginata*. The largest leaves are over four inches long, regularly toothed and edged with whitish farina. The large flowers, which are carried in umbels of a dozen or more on four-inch scapes, usually have six petals of Aster violet (H.C.C. 38/2) and a small, cream-coloured eye. Exhibited by G. H. Berry, Esq., The Highlands, Ridgeway, Enfield. See p. xxxi.

TRAINING OF MEN AND WOMEN RELEASED FROM WAR SERVICE FOR EMPLOYMENT AS PRIVATE GARDENERS.

THE Royal Horticultural Society has been invited by the Ministry of Agriculture and Fisheries to assist in organizing and operating a scheme of training for suitable men and women who, on their release from the Armed Forces or other War Service, wish to take up private gardening as a permanent career and need instruction for that purpose. The Council of the Society has welcomed the invitation and has undertaken to provide the Ministry with a list of suitable gardens in England

and Wales where twelve months' practical training in gardening can be provided for applicants with little or no previous training. The Council invites owners and occupiers of gardens in England and Wales to volunteer to take one or more trainees on the following conditions, which are similar to those for farm trainees under the Government's Agricultural Training Scheme. The Society, where necessary, will arrange to examine the gardens as to their suitability for training purposes.

(i) The applicants will be interviewed and selected by special local Sub-Committees. A Fellow of the Society will be appointed to serve on each Sub-Committee.

(ii) No contract of service will exist between the trainee and the "training employer." No wages will be payable, but the trainee will receive a standard maintenance allowance from the State.

(iii) In consideration of the value of a trainee's incidental work, the "training employer" will be required to make a contribution to the State. The total contribution will be approximately 60 per cent. of the statutory agricultural wage. At the present rate of 70s. a week (£182 a year) for an adult male worker and in most counties 48s. a week (£124 16s. 0d. a year) for a woman over 18 years of age, the contributions over a full year will amount to £107 8s. 0d. and £72 respectively. Contributions will be payable according to the following scale:

Period.					Contributions.	
					Men	Women
First four weeks	.	.	.	.	Nil	Nil
Next twelve weeks	.	.	.	.	22s.	15s.
" "	"	"	"	"	38s.	25s.
" "	"	"	"	"	54s.	35s.
Last	"	"	.	.	65s.	45s.

(iv) The hours of training will be the normal working hours of the garden, including periodical "duty" (e.g. stoking and watering), but the "training employer" will be expected to remunerate the trainee for "duty" and for work done outside training hours at the appropriate rate.

(v) During training Unemployment and National Health Insurance contributions will not be payable. *Ex gratia* payments similar to those payable to an employee under the Workmen's Compensation Acts may be made to trainees by the State for injuries suffered in the course of training.

(vi) Representatives of the Sub-Committee will visit the gardens from time to time to satisfy themselves that training is proceeding satisfactorily. Where, for any reason, it is not to a trainee's advantage to continue his training in a particular garden, arrangements may be made for training to be continued elsewhere. Where a trainee, after being afforded every reasonable opportunity, is not regarded as satisfactory, his training may be terminated.

(vii) The trainee will be allowed the holidays customary to the garden.

(viii) Where living accommodation cannot be provided by the "training employer" alternative accommodation will be found.

Fellows of the Royal Horticultural Society in England and Wales, and others who are willing and able to provide training on these terms are asked to send in their names and addresses to the Secretary as soon as possible, indicating whether they would prefer a man or woman, and supplying information as to the area and any special characteristics of their gardens, and the staff employed. The Council hopes for a generous and widespread response to this invitation, which affords a practical opportunity of doing a valuable service to a man or woman to whom the nation owes an obligation, and at the same time of assisting to make good the shortage of trained gardeners.

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Part 8

August 1945

THE SECRETARY'S PAGE.

Subscription.—The Secretary desires to draw the attention of the Fellows and friends of the Society to the following Bye-law :—

“ A Fellow, if elected on or after the 1st of July and before the 1st of October, shall pay half a year's subscription.”

The monthly JOURNAL, commencing with the July number, will be sent on election, but should the JOURNALS for the whole year be desired, then a full subscription for the year would be required.

Programme of Meetings.—There will be no Meeting in August, and the next one will take place on Tuesday, September 11 (12 noon to 5 P.M.), when the following competitions will be held :—

Trophy competition for Cacti and Succulents and one for Flower Arrangements for Amateurs : entry forms for these competitions are obtainable on application.

Fruit and Vegetable Show.—The Fruit and Vegetable Show will be held on Tuesday, October 2 (12.30 P.M. to 5 P.M.), and Wednesday, October 3 (10 A.M. to 5 P.M.). Schedules are now obtainable on application to The Secretary, R.H.S. Offices, Vincent Square, London, S.W. 1.

Lectures.—The following lectures will be given in conjunction with the above Meetings at 2.30 P.M. in the Lecture Room of the New Hall :—

On September 11 : “ Vegetative Propagation of Flowering Trees and Shrubs,” by Mr. F. P. Knight.

On October 2 : “ Practical Aspects of the Manuring of Fruit,” by Dr. T. Wallace, in conjunction with the Fruit Group (see p. 220).

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during August and September :—

Flower Garden.

August 8, 9	. Vegetative Propagation of Shrubs	. . .	2-4 P.M.
Sept. 19, 20	. Harvesting and Storing	. . .	2-4 P.M.

Fellows and Associates who desire to attend are requested to notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey. Particulars of how to get to the Gardens were given in the July number of the JOURNAL.

Rose Show.—The National Rose Society will be holding a Show in the Society's Old Hall on Friday, September 21 (12 noon to 6 P.M.) and Fellows will be admitted free of charge, on presentation of their R.H.S. tickets.

Post-war Training.—The attention of Fellows is again called to the scheme for training men and women released from the Forces who wish to become gardeners, as published in the July JOURNAL.

Examination Results :—

General Examination (Juniors), held on March 15, 1945.—Two hundred and seventy candidates entered for this Examination and of these 37 were placed in Class 1; 84 in Class 2; 85 in Class 3; 50 candidates failed; and 14 were absent.

A Silver Medal is awarded to Mr. Roy Cropley of 3 Cupar Road, Battersea, London, S.E. 11, who was First.

General Examination (Seniors), held on March 15, 1945.—Five hundred and twelve candidates entered for this Examination, and of these 10 were placed in Class 1; 116 in Class 2; 207 in Class 3; 133 candidates failed; and 46 were absent.

A Silver-Gilt Medal is awarded to Miss Joan Edith Bentley of Studley College, Studley, Warwickshire, who was First.

Teachers' Preliminary Examination in School and Cottage Gardening, held on March 24, 1945.—One hundred and eighty-two candidates entered for this Examination, and of these 22 were placed in Class 1; 55 were placed in Class 2; 49 were placed in Class 3; 41 candidates failed; and 15 were absent.

A Silver-Gilt Medal is awarded to Miss Edith Gwendoline Gardner of 38 Boma Road, Trentham, Stoke-on-Trent, who was First.

Queen's Institute of District Nursing Gardens Scheme.—We are asked by the Queen's Institute of District Nursing to call attention to the following :—

" Gardens Scheme.

" Do not miss visiting the many gardens that have kindly promised to open under the Queen's Institute of District Nursing Gardens Scheme during the summer for the benefit of district nursing. Lists can be obtained from the Gardens Secretary, 57 Lower Belgrave Street, London, S.W. 1."

Invited Trials, 1946 :—

TO BE JUDGED IN 1946.

Vegetables.

Broad Beans	. 1 pint of each variety	} Entries to be received at Wisley not later than January 15, 1946.
Early Peas	. $\frac{1}{2}$ " " "	
Leeks	. 1 oz. " "	
Spinach	. 1 " " "	
Turnip	. 1 " " "	
Cabbage (autumn sown)	$\frac{1}{2}$ " " "	} Entries to be received at Wisley not later than June 15, 1946.

Flowers.

Godetia	.	.	1 packet of each variety	} Entries to be received at Wisley not later than January 15, 1946.
Clarkia	.	.	1 " " "	
Eschscholtzia	.	.	1 " " "	

Preparation for Trials in 1947.

To prepare for trials given in the Biennial Calendar, some of the seeds are required sufficiently in advance to become established by the time appointed for their consideration by the judges, namely:—

To be sent in 1946, for judging in 1947	{	Cornflowers	{ Autumn sown, one packet of each variety. Entries to be received at Wisley not later than June 15, 1946.
		Larkspurs	

Plants and Seeds for Invited Trials.—Anyone desiring to send a variety or strain to an invited trial must obtain from the Director of the Gardens an entry form which must be completed and returned by a specified date. The entrant must certify on the form either

- (a) that the variety or strain has been raised or developed by him, or
- (b) that the variety or strain was, or is about to be, introduced by him to British commerce.

The entrant must also supply sufficient particulars of the history of the variety or strain to substantiate his certificate, but such particulars will not be published by the Society without the sender's consent.

To provide a standard for comparison, varieties which have previously received an F.C.C. or an A.M. will, usually, be included in a trial, but no such variety can be accepted for trial unless the prospective sender certifies that what he proposes to send represents an improved or re-selected strain of the variety, and unless he, at the same time, supplies sufficient particulars of the history of the strain to substantiate his certificate.

The entries for an invited trial will be examined by a Sub-Committee who will decide what entries shall be accepted and what standard varieties shall be included for purposes of comparison. Each entrant will be notified by the Director of the Gardens of the Sub-Committee's decision in regard to his entry, and, if the decision is favourable, the entrant will be asked to send a specified quantity of plants, seeds, bulbs, or other material to Wisley by a stated date.

Calendar of R.H.S. Invited Trials.

1946.		1947.
Flowers	{ Clarkia	Calendula
	{ Godetia	Nasturtium
	{ Eschscholtzia	
	{ Cornflowers	
	{ Larkspurs	
Vegetables	{ Broad Beans	Celery
	{ Cabbage (autumn sown)	Maincrop Peas
	{ Early Peas	Runner Beans
	{ Leeks	Vegetable Marrow
	{ Spinach	
	{ Turnip	

The rules governing these "Invited Trials" were published in JOURNAL, June 1945, p. 177, and copies can be obtained on application to the Secretary.

The Fruit Group.—Representations having been made to the effect that the cultivation of fruit in private gardens might be greatly extended and improved if Fellows and Associates interested in the various fruits were provided with additional facilities for meeting and exchanging ideas, the Council has decided to establish, within the Society, a Fruit Group which can meet periodically for lectures and discussions and for visits to research stations, private gardens and commercial fruit plantations. Membership of the Group is open to all Fellows and Associates, without additional subscription. Those who wish to join are invited to apply in writing to the Secretary, who will notify Members by post of all meetings. The first meeting of the Fruit Group will be held at 2.30 P.M. on October 2 in the Lecture Room of the New Hall when Dr. T. Wallace will lecture on "Practical Aspects of the Manuring of Fruit."

WISLEY IN AUGUST.

VISITORS to Wisley during the present month will find the greatest concentration of flowers in the herbaceous borders, but many interesting plants are flowering still in the Rock garden and the Wild garden, while in the standard collections many varieties of Gladioli, Montbretias, Dahlias and border Chrysanthemums will be at their best.

In the shrub collections flowers are less numerous, and touches of warm colouring appearing among the green tints of the foliage herald the approach of autumn. Some good, late-flowering kinds may be noted around the Laboratory. *Abelia Schumannii* produces a succession of rosy-pink blossoms from early June onwards, and is now succeeded by *A. grandiflora* with paler flowers. Rose 'Mermaid' continues to open its large, single blooms against a background of glossy foliage, and nearby the fine *Hypericum* 'Rowallane Hybrid' will be gay until its display is terminated by autumn frosts. *Indigofera pendula* is a graceful shrub worth noting for its pendulous, rosy-purple racemes often nearly a foot long. Although killed back in winter it is of vigorous and rapid summer growth.

By the wall facing the Iris trial ground the flowers of *Desmodium praestans*, similar in size to those of the *Indigofera*, and of richer colour, are not sufficiently abundant to be really effective, although they contrast prettily with the large, round, silver-backed leaves of this uncommon shrub. *Clematis Rehderiana* is a choice, late-flowering species with vigorous growths carrying panicles of fragrant, aureolin-yellow bells until October. Two excellent summer-flowering varieties of *Ceanothus* growing here are the vigorous, pale-coloured 'Autumnal Blue,' which has an unusually long season, and the deep blue-violet 'Henri Desfosse.'

Among the shrubs still flowering in Seven Acres *Aesculus parviflora*, with erect, candle-like, white inflorescences, is one of the most conspicuous. *Spiraea Billardii* and the forms of *S. japonica* strike a bright note in rose and crimson, and the purple plumes of *Buddleia Davidi* and the woolly-leaved *B. stenostachya* are much in evidence. The species of Dogwood also deserve mention. *Cornus paucinervis* has reddish-brown branches, dark leaves and large, dense cymes of creamy flowers like those of *C. alba*, but followed by black, instead of

white, berries. The purple-stemmed *C. Amomum* will soon be ripening slate-blue fruits among bronze-tinted foliage. *C. Kousa* also colours well, but rarely produces its attractive red fruits at Wisley.

Pleasant patches of colour are formed in the Heath garden by the many varieties of *Erica cinerea* and *E. vagans*, the taller *E. terminalis*, still opening rosy-pink bells above faded, rust-tinted clusters, and the variously-coloured forms of Ling. The collection also includes some interesting hybrid Heaths, such as the Irish *E. Mackaii* and *E. Praegeri*, and *E. Williamsii* and *E. Watsonii*, both from Cornwall; all of which have *E. Tetralix*, the Cross-leaved Heath, as one parent.

In the Wild garden several Hydrangeas are flowering. *H. paniculata* var. *grandiflora* is a most desirable shrub with large heads of sterile white flowers passing to pink in fading; *H. Sargentiana*, which prefers the more shady positions, is of completely different appearance, with large, dull green, hairy leaves and flat, violet, white-margined corymbs. *H. macrophylla* (*hortensis*) is represented by several forms, including the rosy-pink variety *Mariesii*. The rich blue of the Willow Gentian, *G. asclepiadea*, is conspicuous in many places, and towards the end of the month bright patches of *Cyclamen neapolitanum* will have appeared. *Lilium superbum* is at its best in moist beds beneath the shade of the oaks, lifting its fine heads of orange flowers to a height of ten feet.

The visitor may be sure of finding some interesting plants in the Half-hardy house. *Mandevilla suaveolens*, climbing to the top of the house, is laden with sweet, white flowers, and close beside it the graceful, leafy stems of *Littonia modesta* carry pendent blooms of saffron-yellow. The thick scapes of *Haemanthus coccineus*, crowned with dense, scarlet-bracted heads, are rising from the rough-scaled bulbs, and beside the path the pink trumpets of *Habranthus robustus* closely resemble the flowers of some of the *Zephyranthes* which appear at this season. *Moraea iridioides* produces fresh crops of white, iris-like flowers at intervals all through the summer. *Cuphea micropetala*, *Diplacus glutinosus*, *Bouvardia triphylla* and *Lantana Camara* are other plants whose long season of flowering makes them especially valuable. Some of the more showy plants in the Temperate house are *Plumbago capensis*, *Hibiscus Waimiae* with large white, rose-centred flowers, *Solanum Wendlandii* with broad panicles of lavender potato-like blossoms, and *Dianella caerulea*, whose sprays of violet berries and fans of narrow foliage are borne on slender, bamboo-like stems. *Lonicera Hildebrandtiana* is remarkable for the length of its deep yellow, honeysuckle flowers, and the blood-red *Rhododendron Kyawii* is the last of this great genus to open its buds.

Visitors who are interested in vegetable-growing should make a point of inspecting the trial ground in Wisley village, for at no time of the year is there more to be seen here. In the trials of lease-lend seeds carried out by the Society at the request of the Seeds Import Board will be found most of the well-known standard varieties of Runner Beans, Beet, Sweet Corn, Marrows and Ridge Cucumbers. Onions are well represented by a collection of the American varieties grown from spring-sown seed produced in the U.S.A. and Canada, as well as by more familiar English varieties grown from home-produced seed. The R.H.S. Invited Trials also include many stocks of Cabbages and Carrots raised from seed grown in this country.

GARDEN WORK.

REMINDERS FOR AUGUST.

Vegetable Garden.—Keep a watchful eye on the water requirements of Runner Beans, Vegetable Marrows, Celery, etc., and when water is necessary give copious supplies. Other routine work consists of the timely thinning of seedlings, hoeing, and the control of insect pests and diseases.

In many gardens in the southern half of the country it is possible to overwinter plants of Cabbages, Lettuces, Onions and Spinach during an average season. In other parts of the country where these conditions do not obtain it is safer to overwinter the above-mentioned crops in cold frames or under cloches. With regard to Cabbages it is advisable to make a sowing of suitable varieties such as 'Ellam's Early,' 'Early Offenham,' 'Flower of Spring,' etc., during the first week, making a further sowing about the middle of the month. During the second week make a sowing of Spinach to provide leaves during the autumn and the following spring; it will be advisable to make another sowing about the end of the month. Onions for pulling green for salad purposes should also be sown in the second week; 'White Portugal' or seeds of any of the cheap varieties are suitable.

In those districts where Onion Fly is known to be troublesome, it is a good plan to sow in a nursery seed bed, about the middle of the month, seeds of suitable good keeping varieties for planting out in spring, such as 'Autumn Queen,' 'Ebenezer,' 'Rousham Park Hero,' etc., on ground which is well drained and, if possible, having a certain amount of natural protection. Towards the end of the month sow seeds of Lettuce 'Imperial,' 'Arctic,' 'Winter Crop' or any other suitable variety to overwinter.

Successional sowings of Turnips for storing and one of Broad-leaved Endive should be made during the first week.

If not already done, complete the planting of Winter Green crops and Leeks, making certain that ample provision has been made for these important crops.

Celery for early supplies should now receive the first earthing after having removed the suckers from the base of the plants and lightly tying same. It is advisable to give the trench a thorough soaking with water before earthing. The plants should benefit from periodical dustings of soot, which also helps to keep the Celery Fly in check.

As a means of supplying green manure to ground not required for immediate cropping, sow seeds of Mustard for digging in as soon as the plant has reached the flowering stage.

When the foliage of August-sown Onions shows signs of ripening, it should be turned down in order to expose as much as possible of the bulb to the ripening influence of the sun and, about a fortnight later, lift the bulbs and lay them with the roots facing the sun.

Keep a close watch on crops, such as Beans, Peas, Onions, etc., reserved for seed purposes; gather before there is any loss due to over-ripening.

Fruit Garden.—In order to obtain the best results Strawberry runners taken this season must be planted out in their fruiting position as soon as they have made sufficient roots for successful transplanting. If the ground on which it is intended to plant them has not been

prepared no time should be lost in getting this done. Strawberry plants require generous treatment and, where necessary, apply a good dressing of farmyard manure, but do not bury too deeply. Ground which has just been cleared of an early crop of Beans, Peas or Potatoes, which was well prepared and manured for these crops, should be ideal and might only require a dressing of an organic fertiliser such as Bonemeal, Shoddy, or Hoof and Horn. For varieties of average vigour allow 2 feet between the rows and 18 inches between the plants. It is important to plant the crowns firmly and at the correct depth.

Immediately the fruit has been gathered remove all the old fruiting canes of summer-fruiting Raspberries and any surplus young ones not required for next season's crop. Where supports are provided tie in the young canes about 6 inches apart. Do not tip the retained shoots until February.

Black Currants should also be pruned at this time, but the operation is not quite so simple as in the case of the Raspberry. Cut out as much as possible of the two year and older wood, retaining only sufficient of the last mentioned to support the requisite number of this year's shoots necessary to form a good bush. The present is a good time to give the bushes a dressing of Nitrogen.

Earliest varieties of Apples such as 'Beauty of Bath,' 'Mr. Gladstone,' 'Laxton's Advance,' etc., will now be ripening and the fruits of these varieties will not remain long in good condition, therefore they should either be used or disposed of as soon as gathered. These remarks apply to the earliest varieties of cooking Apples, also the early Pears.

Birds and wasps often prove troublesome in attacking the fruits of Apples, Pears, Peaches, etc.; where these are grown as trained trees it is an easy matter to fix nets to protect from birds, but muslin or paper bags will be necessary to protect from wasps. Every effort should be made to destroy wasps either by trapping or, better still, destroying the nests.

Flower Garden.—Where it has been decided to transplant Madonna Lilies or plant new bulbs the present month is a good time for this operation. Select a well-drained and fairly sunny position, covering the bulbs with not more than 1 inch of soil.

In addition to Daffodils many of the early flowering bulbs such as Chionodoxas, Crocuses, Erythronium (Dog-tooth Violets), Fritillarias, Leucojum (Snowdrops), Scillas, etc., should now be planted. New colonies of Belladonna Lilies and Colchicums should also be planted this month.

The present is a good time to propagate many of the hardy flowering shrubs by inserting cuttings in a sand frame placed in a shady position.

Make a point of examining the flower buds of early flowering Chrysanthemums at least once a week and carry out the necessary disbudding.

Remove the faded flowers of Dahlias and tie the new growths as they develop.

When the healthy growths of Sweet Peas, grown as cordons, have reached the top of their supports, their period of flowering can be prolonged by releasing them from their stakes, running each plant horizontally close to the ground and retraining to a support a little distance away.

Many of the Rambler Roses will now have passed out of flower and

the removal of the old flowering shoots need not be delayed. In their place tie in the new growths made this season ; the increased light and air these receive should have a beneficial ripening effect.

Cold Greenhouses and Frames.—In those districts where conditions are unfavourable for Onion plants wintering in the garden, make a sowing either in a suitable frame, or in a position where movable frames or cloches can be transferred at a later period when protection becomes necessary. Onions for salad purposes should be sown early in the month and suitable good keeping varieties, for planting out next spring, about the second week. Parsley can be treated in a like manner.

In an average season it should be possible to overwinter Antirrhinums, growing in pots for indoor decoration, either in a greenhouse or frame without artificial heat. The intermediate varieties are most suitable for this purpose and seeds should be sown about the last week of the month.

Available bulbs for early forcing are better potted or placed in bowls before the end of the month. Plunge the receptacles in a bed of leaf mould, peat or similar material or place in a cool, dark cellar or cupboard for about six weeks.

Self Blanching Celery is improved by applying a covering to exclude the light, such as mats laid over the plants or straw placed between the stems ; at this time of the year the crop is usually ready for use about a fortnight after the commencement of this treatment. Successive batches of plants sufficient for requirements should be dealt with in this manner.

If weather conditions are unfavourable for the drying of Shallot and August-sown Onion bulbs in the open, spare cold frames can be used for this purpose, also for the ripening of Beans and Peas for seed purposes.

The bunches of Grape Vines should now be showing signs of ripening ; white Grapes are improved at this stage by exposing the bunches to the light by tying the leaves away from them. As the Grapes ripen the amount of atmospheric moisture should be reduced, especially towards nightfall, and a current of air should be maintained both day and night.

As soon as the fruits of the earliest Peaches and Nectarines are gathered, cut out as much of the old bearing wood as necessary and regulate the new shoots in order that they become thoroughly ripened. Syringe the trees twice daily in order to keep Red Spider in check and, except where the trees are unduly vigorous, give a final dressing of some approved complete fertilizer. From now onwards afford all the ventilation possible both day and night.

NEW TYPES OF HYBRID RHODODENDRONS FOR THE SMALL GARDEN.

By J. P. C. RUSSELL.

(Lecture given on May 1, 1945; Mr. T. Hay in the Chair.)

THE hybridization of Rhododendrons began in the early nineteenth century with the crossing of the first and hardiest of the Rhododendron species to be introduced. *RR. ponticum*, *caucasicum*, *catawbiense* and *maximum* were used, and an attempt was made later on to introduce the magnificent colouring of *R. arboreum* into this hardy race.

Towards the end of the century *R. Thomsonii* and *R. Griffithianum* were used to a large extent on the old hybrids and some very fine Rhododendrons were produced. These older hybrids form the bulk of the plants in most gardens where Rhododendrons are grown. In Cornwall, with the aid of a mild climate, a magnificent race of hybrids was evolved from the more tender species. These are not well known outside Cornwall and, with some exceptions, are not generally hardy.

The small group of species Rhododendron from which the old hardy hybrids began over a hundred years ago were very similar to each other in appearance, and in consequence their multitudinous children show little variation in leaf or flower. Yellow, orange and clear red are absent from their colour range, and most of the crimson and pink varieties show a strong tinge of blue. Despite these criticisms they are the only Rhododendrons for the completely open and exposed garden. The later crosses with *R. Thomsonii* and *R. Griffithianum* introduced a little more variety and produced one very good hardy red in 'Ascot Brilliant.'

The introduction of the Rhododendrons of China, Tibet, Burma and Assam by WILSON, FARRER, FORREST, ROCK and KINGDON WARD and, more recently, those sent home by SHERRIFF and Professor YU have shown us the great diversity of the Rhododendron family. These wild plants range from the prostrate, mat-forming *R. radicans* to the stout upstanding boles and monstrous leathery leaves of the *Grande* series. In between are Rhododendrons with round leaves, lanceolate leaves, needle-like leaves, smooth and shining leaves or leaves covered with a soft indumentum. In colour they may be anything from dark black-green to a lovely glaucous green, very close to blue; the young growth is soft pale green, copper or even verdigris colour; in some series it is covered with bright orange indumentum. The flowers are trumpet-shaped, tubular, bell-shaped, almost flat or shaped like butterflies; some are scented, and they are of every colour, white, scarlet, yellow, orange, pink, and some of them come very close to blue. These wild species are very lovely, but are little known as yet; many of them need considerable patience before they reach the flowering stage: some are tender, a few are difficult to grow. They have provided an immense field for the hybridist, and some of the finest plants that can be grown in our gardens have been raised by crossing these species with one another and with the old hybrids. It is about these plants that I am going to talk to-day.

Hybridization on a large scale requires a lot of time and a lot of room and, almost without exception, we owe these new hybrids to the skill and keenness of amateur growers. The hybrids fall into three groups: crosses between species and hybrids in the *Elepidote* group,

crosses between species and species in the *Elepidote* group, and hybrids in the *Lepidote* group. The first lot are mostly similar to the old hybrids, but have a much greater range of colouring and a greatly extended flowering season. The other two groups contain the most beautiful shrubs I know (except for the species themselves), and the *Lepidote* group of hybrids is particularly interesting, as most of them can be increased easily from cuttings, and the hybrids with the *Lapponicum* series are as hardy and as easy to grow as Heather.

I do not think that people consider habit of growth and foliage sufficiently when buying Rhododendrons. The plants are in flower for a comparatively short period, and Rhododendron foliage in the mass can be somewhat oppressive. It is one of the chief beauties of these new hybrids that they vary enormously in shape and colour of foliage and in habit of growth, ranging as they do from low mounds to tall trees. They have the grace and beauty of the wild species from which they are bred, the same lovely colouring, but are easier to grow and flower freely at a young stage.

It is not possible to say anything definite about hardiness. The first thing to be remembered is that the species from which they are bred are, with the exception of the Lapponicums, plants for light woodland conditions in this country. Woodland conditions do not imply the possession of a wood but simply shelter from the wind and light overhead shade. I have had some of the hybrids of rather tender parentage at HARRY WHITE's old nursery at Windlesham for the last two years. It can be a very cold place, is at the bottom of a frost pocket, and is exposed to the east. As a result we are almost certain to be visited by every spring frost; it is the early morning sun shining from the east on to frozen plants which causes bark-split and blackens young growth. We find that only a winter of exceptional severity (such as 1939-40) damages the Rhododendrons here, but as we are open to the east the spring frost can, and usually does, do its worst. The *Griersonianum* hybrids with *R. Elliottii*, *R. Kyawi*, and *R. eriogynum* came through 16 degrees of frost last May with only minor damage and survived 2 degrees below zero last winter quite undamaged, a test which their parents found very trying. I regard this as a pretty good test and consider that, given light woodland conditions and protection from the early morning sun, these new hybrids should prove perfectly hardy. Cultivation is the same as for any Rhododendron, briefly: good drainage, lime-free soil, and plenty of leaf-mould. In the north of England and Scotland the *Griersonianum*, *Kyawi*, *Elliottii*, *erigynum* and *auriculatum* hybrids will need more sun as they are inclined to make their growth very late in the season.

It is not possible to mention more than a few of the more outstanding plants in the space of a lecture, and I have left out the very large-growing *discolor* and *auriculatum* hybrids and plants of the *Loderi* type, as they really grow too large for the small garden. There are two things to remember before judging a new Rhododendron, especially if judging it from a small piece at a show. One is that a good show plant is not necessarily a good garden plant, and the other is that it is very difficult to judge the final effect of a Rhododendron during the first few years when it commences to flower.

I think the least confusing way is to take the hybrids by colour groups, and as perhaps the greatest advance has been made with the reds, I shall start with them.

RED HYBRIDS.

Until the advent of *Rhododendron Griersonianum* there were very few true red Rhododendrons which could be grown outside Cornwall. However there are two of these Cornish reds which are quite hardy in woodland and can hold their own in any assembly.

R. Shilsoni was raised in 1900 from *R. Thomsonii* \times *R. barbatum*, and forms a large bush or small tree, rather similar to *R. Thomsonii* in growth and foliage, but there are more flowers to the truss and they have a strong infusion of the dazzling bright scarlet of *R. barbatum*.

'GILL'S CRIMSON,' parentage unknown, is an extremely fine Rhododendron with a shapely truss of clear red flowers, most brilliant in the sunshine.

These are both early flowerers.

More recently Messrs. C. B. VAN NES have produced many fine hybrids by using the pollen of 'Queen Wilhelmina' on to various hardy hybrids and have produced one quite outstanding red Rhododendron in the 'Earl of Athlone,' a medium grower with fine trusses of bright blood-red flowers. So many fine reds have been produced recently that it is difficult to choose amongst them. I propose to take those with *Griersonianum* blood in them first. *R. Griersonianum* itself is a rather straggly, loose-habited plant with lovely geranium-red flowers, a colour quite different from any other Rhododendron. It flowers late in the season and is on the border-line of hardiness here, but its hybrids have proved themselves to be quite hardy. I have divided them into three groups, tall growers, medium growers and dwarf growers; two, 'Romany Chai' and 'C. P. Raffill,' come into a later group of reds.

Tall-growing.

The three plants in this group are remarkable in that they are hybrids amongst four species which are very much on the border-line for hardiness, but the hybrids appear to be quite hardy under woodland conditions.

'FUSILIER' (*R. Elliottii* \times *R. Griersonianum*), a very well-bred shrub in appearance; the foliage is well shaped and a pleasing light green. The flowers resemble *R. Griersonianum* but are larger, more to the truss, and are a brighter red.

'TALLY HO' (*R. Griersonianum* \times *R. eriogynum*), a magnificent plant which resembles 'Fusilier' but has rather more open flowers with more scarlet in them and flowers in mid-June, a fortnight later than 'Fusilier.'

'ROMAREZ' (*R. Griersonianum* \times *R. Kyawi*) is perhaps the finest of the three; it flowers at the same time as 'Tally Ho,' and the flowers are a clear brilliant red with no spotting.

Medium-growing.

'VANGUARD' (*R. Griersonianum* \times *R. venator*), a very fine plant, flowering in early May; 'Vanguard' has a large truss of about twenty rather tubular flowers of a very bright red, spotted inside the corolla with black.

'MATADOR' (*R. Griersonianum* \times *R. strigillosum*), a very well-habited shrub with the upright growth and general appearance of *R. strigillosum*. The bright scarlet flowers are held in a loose truss. It flowers in April.

'LAURA ABERCONWAY' (*R. Griersonianum* \times *R. Barclayi*) is a truly magnificent plant with fine dark-green leaves and large flowers of geranium-lake. The flowers are rather funnel-shaped and about 3 inches across.

'RED DRAGON' (*R. Griersonianum* \times *R. Thomsonii*) has the good habit of *R. Thomsonii* and a well-spaced truss of *R. Griersonianum* flowers.

'HECLA' (*R. Thomsonii* \times *R. Griersonianum*) has more orange in the flowers.

Dwarf-growing.

These dwarf scarlet hybrids are amongst the most brilliant plants that can be grown in any garden. After reading KINGDON WARD's description of *Rhododendron repens* flowering in Tibet and flowering so freely that it makes the cliffs appear scarlet, one is often disappointed at its behaviour in this country. It is a problem plant, and I think the answer is to grow the dwarf hybrids such as 'Ethel,' 'Jaipur,' and 'Venapens.'

'ETHEL' (*R. 'F. C. Puddle'* \times *R. repens*) is a very dwarf plant forming a wide mass seldom more than a foot high. The flowers are four to five in a truss and of a light crimson-scarlet, with the very distinct double calyx inherited from *R. neriiflorum*.

'ELISABETH' (*R. Griersonianum* \times *R. repens*) is a slightly larger grower than 'Ethel,' with about five flowers to the truss of a clear deep red. It has a more campanulate corolla than *R. repens*, and the leaves are small and dark green.

'DAINTY' (*R. 'May Day'* \times *R. 'Elisabeth'*) is a magnificent plant with a truss of deep red flowers. It has inherited the lacquered appearance and double calyx of *R. haematodes*.

'MAY DAY' (*R. haematodes* \times *R. Griersonianum*) verges on being a medium grower. It is a very fine thing indeed; the large bright scarlet flowers are carried on long pedicels and form a lax truss.

'F. C. PUDDLE' (*R. neriiflorum* \times *R. Griersonianum*) is one of the earlier *Griersonianum* hybrids and is still one of the best. The flowers are a splendid vermilion-scarlet and, I think, have more orange in them than any other plant in this section.

This dwarf group are all late April or May flowering.

Red Hybrids with other than Griersonianum blood.

Tall-growing.

'CHANTICLEER' (*R. Thomsonii* \times *R. eriogynum*), a large shrub which is inclined to sprawl a bit. The flowers are large and rather tubular, in a loose, flat-topped truss. They are bright pillar-box red, spotted black inside the corolla. Late April to early May.

'REDWING' (*R. Barclayi* \times *R. Shilsoni*) is a most magnificent tree-like shrub with brilliant scarlet flowers, larger than those of *R. Shilsoni* and in a better truss.

Medium-growing.

'ASPANSIA' (*R. 'Astarte'* \times *R. haematodes*) was given an Award of Merit at the last show, and is a very fine dark red with a very distinct double calyx. May.

'CHOREMIA' (*R. haematodes* \times *R. arboreum*) has the brilliant

scarlet flowers of *R. haematodes* in an *arboreum* truss and is an extremely fine plant with shapely dark green foliage. It takes after both its parents in being a little slow to commence flowering. April.

R. exburiense (*R. didymum* × *R. Kyawi*) and 'Redcap' in the next section are the last two plants to flower here and are valuable for that reason in any case. *R. exburiense* is a magnificent foliage plant and has trusses of very dark red flowers, brilliant in the sunshine. It was the only hybrid which suffered here from the effects of 2 degrees below zero last winter, when it shed a good deal of foliage. Late June to July.

Dwarf-growing.

'VENAPENS' (*R. venator* × *R. repens*), a very dwarf hybrid with magnificent large bright scarlet flowers. April-May.

'JAIPUR' (*R. repens* × *R. Meddianum*), another extremely fine dwarf hybrid with brilliant scarlet flowers, larger than those of *repens* and usually carried in a truss of four. April-May.

'CARMEN' (*R. didymum* × *R. repens*), very dwarf with large bell-shaped flowers in threes, black-crimson in colour—in fact, they look very like Morello cherry jam, except when the sun is shining on them.

'LITTLE BEN' (*R. repens* × *R. neriiflorum*). This hybrid and 'LITTLE BERT' (*R. repens* × *R. euchaites*) combine all the virtues of *R. neriiflorum* and *R. euchaites* with the dwarf habit of *R. repens*. I think that 'Little Bert' is the best. May.

'REDCAP' (*R. didymum* × *R. eriogynum*) is a really magnificent plant, very slow growing and very late flowering. The flowers are dark red and turn the most brilliant colour in the sunlight. Generally in flower in late June and early July.

RED RHODODENDRONS RAISED BY CROSSING SCARLET SPECIES ON TO THE OLD HARDY HYBRIDS.

'BEAU BRUMMEL' ('Essex Scarlet' × *R. eriogynum*) flowers in late June and has trusses of as many as thirty bright red flowers.

'C. P. RAFFILL' ('Britannia' × *R. Griersonianum*) has fine bright red flowers.

'BIBIANI' ('Moser's Maroon' × *R. arboreum*) has the upright habit of *R. arboreum* and dark red flowers in April-May.

'ROMANY CHAI' ('Moser's Maroon' × *R. Griersonianum*) has fine bright red flowers towards the end of June.

'ROMANY CHAL' ('Moser's Maroon' × *R. eriogynum*) is a magnificent late Rhododendron with distinct foliage and very bright red flowers with the black spotting of *R. eriogynum*. Late June.

'GRENADIER' ('Moser's Maroon' × *R. Elliottii*) is the giant of this section and has very large trusses of dark red flowers which turn a wonderful colour in the sunlight. Late June.

YELLOW HYBRIDS.

The yellow species Rhododendron still remain more yellow than any of their children. I have never seen a hybrid which is as yellow as the best form of *R. lacteum* or Hooker's form of *R. campylocarpum*, and a good form of *R. xanthocodon* in the *Lepidote* section is probably the most yellow of the hardy Rhododendrons.

The yellow hybrids started with 'Goldsworth Yellow,' a plant of poor habit and pale colour. There followed a race of *campylocarpum* hybrids introduced by Messrs. SLOCOCK, of which the best are still

some of the most charming *Rhododendrons* that can be grown in the garden. They are all pale yellow, some with a pink flush or a wine-coloured blotch. My personal favourite is 'Butterfly,' but 'Dairy-maid' runs it very close. 'Letty Edwards' and 'Unique' are also very good. To my mind these plants are much superior to the recently introduced 'Diane,' 'Lady Primrose' and other similar hybrids.

All the best yellow hybrids have *campylocarpum* blood in them. I do not propose to discuss the *lacteum* hybrids here, with the exception of 'Mariloo,' as I have not seen many of them. I know at least one grower who considers that *R. lacteum* does not influence the amount of yellow in its hybrids, as there is too much green in the colour of *R. lacteum* itself. This same characteristic occurs with hybrids from the deep greenish yellow *R. campylocarpum* Hooker's form, and all the yellow hybrids are bred from the *elatum* form of *campylocarpum*, which has orange buds and paler flowers.

'DAMARIS' Logan form ('Dr. Stocker' \times *R. campylocarpum elatum*) is the best yellow hybrid that I have seen so far, although the next one and 'Hawk' are very close seconds. The flowers are held in a truss of up to fourteen pips and are of a very good pale yellow, deepening inside the corolla and with a greenish flush in the throat. Late April.

'MARCIA' ('Gladys' \times *R. campylocarpum elatum*) is like an improved form of *R. campylocarpum* itself; the flowers are much more open and are in more of a truss. Both of these should prove to be first-class garden plants. May.

'MARILOO' ('Dr. Stocker' \times *R. lacteum*) has a very fine truss of pale yellow flowers. The foliage shows the influence of *lacteum* very much—an extremely lovely *Rhododendron*. April.

'PENJERRICK' (*R. campylocarpum elatum* \times *R. Griffithianum*) in its best yellow form is one of the loveliest of all *Rhododendron* hybrids. It is by no means new, but has always been rare. It forms a graceful small tree with fine foliage and very lovely, widely campanulate flowers on long pedicels. They open a creamy-pink and turn pale yellow. There is an equally lovely pink form. April-May.

'LADY BESSBOROUGH' (*R. discolor* \times *R. campylocarpum elatum*) is one of the few *discolor* hybrids of suitable size for a small garden. It has very fine foliage, and the loose trusses of large trumpet-shaped flowers are very lovely. In colour they are a pale creamy-yellow. There is an equally lovely variety called 'Roberte' whose flowers open a mushroom-pink and then go pale yellow. May.

'CLOTTED CREAM' (*R. auriculatum* \times 'Neda') is a very fine plant of reasonable stature. The flowers are a pale cream.

The next lot of hybrids are all crosses from the *Soulei* sub-series and have regular trusses of very lovely campanulate flowers. They are ideal plants for the woodland.

'HAWK' (*R. Wardii* \times 'Lady Bessborough') is a very good yellow and intermediate between its parents in shape. The variety 'Jervis Bay' has a claret-coloured eye.

'IDEALIST' (*R. Wardii* \times 'Naomi') has a very good truss of large flowers which open with a pink flush and then go a creamy-yellow colour.

'INAMORATA' (*R. Wardii* \times *R. discolor*) has very fine foliage and a large truss of flowers shaped like *R. Wardii* but much larger. They are a pale cream with a lovely soft primrose flush. The foliage is particularly good.

'HALCYONE' (*R. Soulei* × 'Lady Bessborough') has a truss of large *Soulei* flowers flushed pink on the outside and pale yellow within.

'RIMA' (*R. croceum* × *R. decorum*) is very distinct and has a truss of pale yellow flowers almost as regularly placed as a Dandelion clock.

Colours intermediate between Yellow and Pink.

'DAYDREAM' (*R. Griersonianum* × 'Lady Bessborough') opens a geranium-lake colour and then goes pale yellow. A bush of this with flowers in all stages is very attractive.

'NAOMI' ('Aurora' × *R. Fortunei*) has several varieties and they are amongst the loveliest of woodland Rhododendrons. The foliage is bold and handsome, resembling that of *R. Fortunei*. The flowers are large and beautifully shaped and, like all *Fortunei* hybrids, have a lovely scent.

'NAOMI' A.M. var. and Exbury var. open pink or pink-tinted and then go pale yellow.

Var. 'Nautilus' has flowers about 4 inches across, rose flushed a pale yellow and with a hint of orange and green in the throat.

Var. 'Stella Maris' is like 'Nautilus' but larger.

Var. 'Pink Beauty' is the most lovely soft shell-pink.

WILLIAMSIANUM AND ORBICULARE HYBRIDS.

All of these hybrids are reasonably dwarf and all have retained something of the lovely foliage and perfect habit of their wild parents. In every case the flowers are widely campanulate.

'COWSLIP' (*R. Wardii* × *R. Williamsianum*), a combination of two very lovely species, has here resulted in an equally beautiful hybrid (by no means always the case); the flowers are sometimes pink and sometimes a pale creamy-yellow.

'MOONSTONE' (*R. Williamsianum* × *R. campylocarpum*) is another very charming plant. The flowers are held in a loose truss and open a rather opalescent pink; they turn pale yellow before falling.

'DORMOUSE' ('Dawn's Delight' × *R. Williamsianum*) is a rather large bush with very attractive flowers in a soft pink.

'ARTHUR J. IVENS' (*R. Williamsianum* × *R. Houlstoni*) is an attractive little plant with loose trusses of Persian rose flowers 3 inches across.

'ETHYL' (*R. orbiculare* × *R. campylocarpum*) has very attractive flowers of a soft creamy-yellow suffused pink.

R. Williamsianum × *R. orbiculare* was raised at Kew many years ago and seems never to have been named. In any case it is a very attractive plant with good trusses of pale pink flowers.

PINK HYBRIDS.

'VANESSA' ('Soulbut' × *R. Griersonianum*) is a most attractive medium-sized hybrid, late flowering. It has good foliage and the soft pink flowers are very pretty. In the F.C.C. form the flowers are heavily spotted in the throat, and I much prefer 'Vanessa B form,' which is unspotted but has a claret flush at the base of the corolla.

'HIRAETHLYN' (*R. haematodes* × *R. Griffithianum*) is a very distinct plant; the flowers are large and waxy in texture, and of a good pink with a wine-coloured flush.

'SUNRISE' (*R. Griersonianum* \times *R. Griffithianum*) is a very beautiful plant. The buds are a soft vermilion and the flowers open deep pink and then fade until only the tips of the petals and the base of the corolla remain pink. The flowers are large and in a good truss.

'AZOR' (*R. discolor* \times *R. Griersonianum*) is a useful late-flowering *discolor* cross which does not grow too big. The flowers are large and of a good but slightly blue pink.

'PINK QUEEN' (parentage unknown) is attractive and resembles a diminished pink *Loderi*.

WHITE HYBRIDS.

Plants of reasonable stature are very scarce amongst the new hybrids although there is a very fine series of skyscrapers, raised from *RR. auriculatum*, *discolor* and *diaprepes*.

'SNOW QUEEN' (*R. Halopeanum* \times *R. Loderi*) is very attractive and a very pure white.

'MAY QUEEN' (*R. Fortunei* \times ?) is also very good, and if more are required there are few better whites than the old 'Duchess of Portland,' 'Hélène Schiffner' and 'Mrs. A. T. de la Mare.'

DICHROANTHUM HYBRIDS.

The flowering of *Rhododendron dichroanthum* introduced a new colour into the race; in its best forms it is a good orange. Hybrids from this have produced a range of very charming plants varying from salmon to very nearly orange.

The first hybrid to appear was a natural cross between *R. neriflorum* and *R. dichroanthum*, which germinated here amongst collected seed of *dichroanthum*. It occurred in several gardens and varies from a very attractive salmon shade to bright scarlet. It has since been named 'Nereid.'

'BERRYROSE' var. 'BELVEDERE' ('Doncaster' \times *R. dichroanthum*) was one of the first of this type. I have not seen 'Berryrose' itself, but 'Belvedere' has a large flat-topped truss of double-calyxed flowers. The colour is a bright salmon-red with an orange flush.

'ASTARTE' (*R. dichroanthum* \times 'Penjerrick') is a pleasing apricot shade.

'SHOT SILK' (*R. campylocarpum* \times *R. dichroanthum*) and

'BREAK OF DAY' ('Dawn's Delight' \times *R. dichroanthum*) are both very charming plants of an intermediate shade between their parents.

'FABIA' (*R. dichroanthum* \times *R. Griersonianum*) is an extremely fine plant. It is a spreading, low-growing shrub with loose trusses of pale salmon-pink flowers with an orange flush.

'FABIA' var. 'TANGERINE' is also very good and considerably darker in colour. It is described in the JOURNAL as vermilion, shaded geranium lake with a poppy-red throat.

'FELIS' (*R. dichroanthum* \times *R. facetum*) has large flowers of a pale pink shaded orange.

'GOLDEN HORN' (*R. dichroanthum* \times *R. Elliottii*) is a well-shaped bush with loose trusses of large trumpet-shaped flowers with a very distinct double calyx. The colour is a fine orange, overlaid salmon-red and spotted brown in the throat. This is a very good hybrid and can look very orange in certain lights.

'DIDO' (*R. dichroanthum* \times *R. decorum*) I have not seen, but I am told on very good authority that it is coppery-orange.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

MAY 1, 1945.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. J. Cheal & Sons, Crawley, for an exhibit of flowering trees and shrubs.

To Messrs. Notcutt, Ltd., Woodbridge, for an exhibit of Lilacs.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Rhododendrons.

Silver Flora Medal.

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering trees and shrubs.

To Mr. E. Ladhams, Elstead, for an exhibit of Alpine plants and flowering shrubs.

To Major E. de Rothschild, Exbury, for an exhibit of Rhododendrons.

Silver Banksian Medal.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of Alpine plants.

Flora Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

Banksian Medal.

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of hardy and tender plants.

Award of Merit.

To *Calanthe nipponica* as a hardy, flowering plant (votes 11 for, 0 against), from the Rt. Hon. Lord Swaythling, Southampton. See p. 245.

To *Rosa ? xanthina* as a hardy, flowering shrub (votes unanimous, subject to verification of name), from Messrs. L. R. Russell, Ltd., Windlesham, Surrey.

To *Wistaria venusta* as a hardy, flowering shrub (votes unanimous), from Messrs. Notcutt, Ltd., Woodbridge, Suffolk. See p. 247.

Other Exhibit.

Exhibit of flowering shrubs by E. H. Savill, Esq., Windsor Great Park.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Stuart Low & Co., Jarvis Brook, Sussex, for a group of Orchids.

Award of Merit.

To *Wilsonara* × 'Coriola' (*Odontioda* 'Apiola' × *Oncidium corynephorum*), (votes 6 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 247.

To *Vuylisteheara* × 'Adria' (*Miltonia* 'Lycaena' × *Odontioda* 'Rona') (votes 6 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 247.

NARCISSUS AND TULIP COMMITTEE.—Mr. G. E. LEAK, V.M.H., in the Chair, and four other members present.

Award Recommended :—

Silver-gilt Flora Medal.

To Messrs. Barr & Sons, 13 King Street, Covent Garden, London, W.C. 2, for an exhibit of Tulips.

XXXVIII PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron* 'Idealist' (*R.* 'Naomi,' Exbury variety \times *R. Wardii*), from Major E. de Rothschild, Exbury, Southampton. See p. 246.

To *Rhododendron* 'Golden Horn' (*R. dichroanthum* \times *R. Elliottii*), from Major E. de Rothschild. See p. 246.

To *Rhododendron* species, *Irroratum* series, from Major E. H. Savill, Windsor Great Park. See p. 246.

To be sent to the Scientific Committee.

Rhododendron species of the *Stamineum* series, from Lord Aberconway, Bodnant, N. Wales.

For Trial at Wisley.

Rhododendron 'Chiff-Chaff' and *Rhododendron* 'Redshank,' from Captain Collingwood Ingram, Benenden, Kent.

Other Exhibits.

Rhododendron 'W. Leith' and *Rhododendron rude*, from Admiral Walker-Henage-Vivian, Clyne Castle, S. Wales.

Rhododendron haematodes \times *Elliottii*, from Major E. de Rothschild.

Rhododendron 'Patrick' and *Rhododendron* 'Cinnkeys,' from W. I. Whitaker, Esq., Lympington, Hants.

JOINT ROCK-GARDEN PLANT COMMITTEE.—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Awards of Merit.

To *Leiophyllum buxifolium* var. *prostratum*, from Dr. P. L. Giuseppe, Trevoze, Felixstowe. See p. 245.

To *Cypripedium parviflorum* (syn. *pubescens*), from H. Clifford Crook, Esq., 4 Alexandra Crescent, Bromley. See p. 245.

Cultural Commendation.

To Dr. P. L. Giuseppe, for *Didissandra lanuginosa*.

MAY 15, 1945.

THE SEWELL MEDAL COMPETITION.

Amateur's Medal.

To Dr. P. L. Giuseppe, Trevoze, Felixstowe.

Horticultural Trader's Medal.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Proliferous Clematis montana.—Dr. Tincker showed a 'proliferous shoot of *Clematis montana*, the axis growing beyond the original flower and bearing a small leaf with a terminal flower with 8 sepals.

Aberrant Colchicum cilicicum.—Mr. Bowles showed a plant of *Colchicum cilicicum* with two flowers with very narrow perianth pieces appearing among the leaves as the fruit usually does at this time, the growth being somewhat similar to that shown in the plate in English Botany of *C. autumnale vernale*. Six bulbs in a row had so behaved in Mr. Murray Thompson's garden in Dundee. The old corm had evidently been damaged by some gnawing animal and was devoid of roots, but a few roots had developed on the foot of the new corm.

Alleged reversion in Irises.—Sir Mervyn Manningham-Buller enquired as to the cause of Irises reverting. He wrote referring to "the reversion of bearded Irises of different sorts to the common dark blue one. A number I have had such as 'Bruno,' 'Princess Louise,' etc., have reverted, particularly some I moved two years ago." The Committee knows of no authenticated case of such reversion. The experience of such phenomena, which are not infrequently reported, leads to the conclusion that some other explanation than actual change of identity is the true one, especially, e.g., the inadvertent transplanting of vigorous invaders which may not have flowered before being transplanted or the flowering of which had passed unnoticed, and where such apparent reversion is



FIG 70 — A GIANT STOCK.
(See p 234)



Photo, Collingwood Ingram

FIG 71 — *RIMARIA HEATHII* IN THE KARROO
(See p 230)



FIG. 72.—EUCRYPHIA GLUTINOSA
From the *Botanical Magazine*, t. 7067
(See p. 238.)



FIG. 73 — RHODODENDRON AMOENUM
From the *Botanical Magazine*, t. 4728.
(See p. 238.)



Photo, Malby]

FIG 74 — ANEMONE UMBELLATA
(See p 235)



Photo, Malby]

FIG 75 -- THALIMUM PSILOTIFOLIUM
(see p. 236)



Photo, Malby]

FIG 76 — THYMUS MEMBRANACEUS

(See p 237)



FIG 77 —WELDENIA CANDIDA
(See p 237)

Photo, Malby]



Photo, Malby.]

FIG 78 — *DIDISSANDRA GRANDIS*
(See p 238)

total, it is due to the survival of the "rogues" and the death or rejection of the often weaker growing or less capable of resisting competition, varieties thought to be transplanted.

Mistletoe on Aesculus octandra.—Mr. G. E. Young of Westhumble Place, Dorking, Surrey, reported finding mistletoe growing on *Aesculus octandra*, on a branch about 3 inches thick. The mistletoe grows around the branch for a length of about 15 inches, making short shoots instead of large bushes as it does on trees upon which it really thrives. The growth which has persisted for some years resembles that seen on small Hawthorns and on Beech. Mr. Young had seen mistletoe in his neighbourhood very commonly on Black and White Poplars, Limes, Whitebeam and Hawthorn, and rarely on Beeches.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRET, V.M.H., in the Chair, and nine other members present.

Exhibit.

Strawberries 'Pine Tree Victory,' and 'Royal Sovereign,' from Mr. H. S. Melbourn, Pine Tree Fruit Farm, Cranborne, Wimborne, Dorset.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seven other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Bees, Ltd., Chester, for an exhibit of herbaceous plants.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Delphiniums and Irises.

Silver Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations and *Dianthus Allwoodii*.

To Messrs. Barr & Sons, Taplow, for an exhibit of Irises, Lupines and Pyrethrums.

Flora Medal.

To Messrs. Thomas Carlile (Loddon Nurseries), Ltd., Twyford, for an exhibit of Lupines and Irises.

To Messrs. W. A. Constable & Co., Tunbridge Wells, for an exhibit of Irises.

Banksian Medal.

To Messrs. Clarence Elliott, Ltd., Stevenage, for an exhibit of Iceland Poppies 'Aurora' Strain.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

Other Exhibits.

Tropaeolum grandiflorum plenissimum 'Hermine Grashoff,' from C. J. Howlett, Esq., The Yews, Earley, Reading.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended:—

Silver Floral Medal.

To Messrs. Notcutt, Ltd., Woodbridge, for an exhibit of flowering shrubs.

Silver Banksian Medal.

To Messrs. Cheal & Sons, Crawley, for an exhibit of flowering shrubs.

Flora Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

Award of Merit.

To *Anchusa caespitosa* as a hardy, flowering plant for the rock garden or border (votes 15 for, 0 against), from Messrs. Bees, Ltd., Sealand Nurseries, Chester. See p. 245.

To *Richardia Rehmanni* as a flowering plant for the greenhouse (votes 17 for, 2 against), from the Duke of Richmond & Gordon, Goodwood, Sussex. See p. 247.

To *Saxifraga cernuensis*, as a flowering plant for the rock garden (votes 12 for, 1 against), from Dr. P. L. Giuseppi, Treviso, Felixstowe. See p. 247.

Other Exhibits.

Dianthus Langeanus, exhibited by Dr. P. L. Giuseppe, Felixstowe.

Fuchsia procumbens, exhibited by C. J. Howlett, Esq., Reading:

Rosa laevigata, exhibited by the Misses Godman, Horsham.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Award of Merit.

To *Odontioda* × 'Zeta' var. 'Nobility' (*Oda*. 'Columbia' × *Oda*. 'Esme') (votes 10 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 246.

To *Dendrobium* × 'Adrasta' (*superbum* × *Pierardii*), (votes 7 for, 3 against), from Messrs. Sanders, St. Albans. See p. 245.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

The only plant before the Committee was an old form of *Narcissus poeticus flore pleno*, from Finden, Derbyshire, sent for identification by H. J. Wain, Esq., Burton-on-Trent.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and seven other members present.

Exhibits.

Show Pinks 'Show Lady,' 'Show Beauty,' and 'Show Crimson,' shown by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex.

JOINT IRIS COMMITTEE.—Col. F. C. STERN, O.B.E., in the Chair, and eight other members present.

Selected for trial at Wisley.

Windermere, and seedling 12/39, shown by H. J. Randall, Esq., Sandilands, Woking, Surrey.

'Grace Tetley,' shown by H. Chadburn, Esq., Marsh Acres, Middleton, Saxmundham, Suffolk.

'Prairie Sunset,' 'Daybreak,' and 'Great Lakes,' shown by Dr. Isobel Lumsden, Auckland Road, Norwood.

'Radiant,' 'Magnolia' and seedling 373A, shown by The Orpington Nurseries Co., Ltd., Orpington, Kent.

Other Exhibits.

'Rhona,' seedlings 21/39 and 60/39/A, shown by H. J. Randall, Esq., Woking, Surrey.

'Sandia,' 'Naranja,' 'Orloff,' 'May Morn,' 'Katharine Dykes,' 'Wildfire,' 'Maid of Astolat,' and 'Junaluska,' shown by The Orpington Nurseries Co., Ltd., Orpington, Kent.

'Grand Canyon,' shown by Dr. I. Lumsden, Norwood.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and five other members present.

Award Recommended :—

Award of Merit.

To *Rhododendron* 'Ivanhoe' (*R.* 'Chanticleer' × *R. Griersonianum*) (votes unanimous), from Major E. de Rothschild, Exbury, Southampton. See p. 247.

For trial at Wisley.

Azalea seedling, from Captain Collingwood Ingram, Benenden, Kent.

Other Exhibits.

Rhododendron yakusimanum, from Major E. de Rothschild.

Rhododendron 'Goldfinch' (*R. astrocalyx* × *R.* 'Mrs. P. D. Williams'); *Rhododendron* 'Infanta' var. 'Hispaniola'; *Rhododendron* 'Zuyder Zee' var. 'Greenfinch,' and *Rhododendron obtusum*, from Captain Collingwood Ingram.

Rhododendron 'Azor' (*R. discolor* × *R. Griersonianum*); *Rhododendron* 'Sunrise' (*R. Griffithianum* × *R. Griersonianum*) and *Rhododendron* 'Vanessa' × *Griersonianum*, from R. D. Trotter, Esq., Leith Vale, Ockley, Surrey.

'JALISCO' ('Dido' \times 'Lady Bessborough') is a most attractive and unusual plant. The flowers are very light and graceful, straw-coloured, tinted orange-rose at the tips of the petals.

LEPIDOTE HYBRIDS.

This is a most interesting section which contains amongst others the *Maddeni*, *Cinnabarinum*, *Lapponicum*, *Triflorum* and *Boothii* series. So far little hybridizing has been done, but such hybrids as we already have are amongst the most valuable and distinct in the family. The most familiar are the race of early-flowering plants raised from *RR. ciliatum*, *dauricum*, *moupinense*, *virgatum*, *racemosum* and *glaucum*. 'Cilpinense,' 'Racil,' *praecox*, *Grievi*, 'Rosy Bell,' 'Early Gem' and *multiflorum* are amongst the best things that any garden can show early in the year.

'TESSA' (*R. praecox* \times *R. moupinense*) is a very good addition to this group with large rosy-lilac flowers in March.

'BRIC-À-BRAC' (*R. leucaspis* \times *R. moupinense*) has large white flowers in March, and combines the size of the *moupinense* flower with the milky-white of *R. leucaspis*.

'BO-PEEP' (*R. lutescens* \times *R. moupinense*) has very much the habit and foliage of *R. lutescens* but with large creamy flowers yellow in the centre, and is a most attractive plant.

'CHRYSAE' (*R. chrysodora* \times *R. leucaspis*) is extremely good, a small stocky shrub with flowers like those of *R. leucaspis* but pale yellow.

'REMO' (*R. Valentianum* \times *R. lutescens*) is a dwarf shrub with rather tubular flowers of a good yellow.

Some time ago Mr. J. C. WILLIAMS crossed *R. cinnabarinum* Roylei with a special form of *R. Maddeni* from Heligan and produced one of the most beautiful plants we have in *Rhododendron* 'Royal Flush'; it was not a new cross then, but no other form has equalled his. There are two forms of this plant: the flowers are like *Lapagerias*, and in one form are pink and in the other pale orange. Unfortunately 'Royal Flush' is not hardy, but the late Mr. LIONEL DE ROTHSCHILD re-crossed both forms on to *R. cinnabarinum* Roylei and produced two of the best and most distinct *Rhododendrons* we have in 'Lady Chamberlain' (from the orange form) and 'Lady Rosebery' (from the pink form).

'LADY CHAMBERLAIN' has flowers like *R. cinnabarinum*, but considerably larger and of a very lovely pale apricot colour, heavily suffused with pink.

'LADY ROSEBERY' is similar but with pink flowers.

There are many varieties of this cross and all of them are good. 'Bodnant Yellow' is outstanding with large orange-buff flowers with a deep reddish flush.

'LADY BERRY' ('Rosy Bell' \times 'Royal Flush') is a dwarfier plant with pale orange flowers suffused pink.

Very recently some most interesting hybrids have been made with *R. concatenans*.

'LEMON BILL' (*R. caeruleum* \times *R. concatenans*) has very waxy flowers of a pale ivory.

'ALISON JOHNSTONE' (*R. yunnanense* \times *R. concatenans*) was shown on April 17, 1945, and is a most charming plant with a good truss of shapely flowers of one of those colours between nankeen and pale pink and impossible to describe.

'ELECTRA' (*R. chasmanthum* \times *R. Augustinii*) is the only hybrid between two members of the sub-series *Augustinii*, and is an extremely fine plant with a good truss of lovely flowers very close to blue.

There are few crosses amongst members of the *Triflorum* series, and in any case most of the species in this lovely series are beyond improvement.

'BLUE TIT' (*R. impeditum* \times *R. Augustinii*) is a first-class small plant with trusses of comparatively large flowers of blue-lilac.

'BLUE DIAMOND' (*R. intrifast* \times *R. Augustinii*) has more of a truss and rather larger flowers.

'BLUE BIRD' (*R. intricatum* \times *R. Augustinii*) is between 'Blue Tit' and 'Blue Diamond.' It is very hard to choose between these three: they are all extremely good, but need to reach some size before their blueness becomes really apparent.

'SAPPHIRE' (*R. impeditum* \times 'Blue Tit') is a dwarfer plant combining the habit of *R. impeditum* with the colour and much of the size of flower of 'Blue Tit.'

A GIANT STOCK.

SOME years before the war a friend who has a garden on the Riviera gave me some seedlings of a Stock, a hybrid (*Matthiola sinuata* \times *Matthiola incana*). It was a very nice garden plant with bright mauve flowers, growing about 18 to 24 inches in height, while varying considerably in its foliage between the types represented by the two original parents. The hybrid produced fertile seed and I raised a batch of seedlings every year.

In the second year of the war I noticed that one seedling of the third or fourth generation that I had raised was inclined to grow more vigorously in its pot than the rest and, when the time came to plant them out, this individual showed no sign of forming its flowering branches. It was therefore not put out with the rest but kept back in its pot.

As it continued to grow vigorously it was put out in a cold greenhouse border. It made no flower at all during the first year when the other seedlings of its batch were flowering outside, but continued to grow.

It put out its first flowers in March or April 1942, when it was about 15 months old, and the same summer it hit the roof of the greenhouse and started to grow downwards again.

From that moment until January this year it flowered almost continuously, and when in full bloom was a grand sight. The confined space of the greenhouse unfortunately prevented me from taking a photograph of it *in situ*.

The zero temperature which we experienced this year was too much for it even in the greenhouse and it died. Fig. 70 is from a photograph of the dead Stock after it had been removed from the greenhouse. It measured from the ground to the point it turned down after hitting the roof 7 feet 10 inches, and the overall length from root to tip of branches was 16 ft. 2 inches.

LEWIS PALMER.

SOME RARE ROCK PLANTS.

By DR. P. L. GIUSEPPI.

(Résumé of Lecture given on May 15, 1945 ; Col. F. C. Stern in the Chair.)

DR. GIUSEPPI began by saying : " Collecting rare Alpine plants is a grand hobby. I cannot help thinking that after this war most of our pockets will be empty, and most of our gardens will be small, and perhaps these plants that I like to think of as enchanting fairies of the mountains will come into their own ; I hope so, because to my mind they are dainty and beautiful. Collecting these plants is a great treat and provides much for your bodies and your minds. First of all, you have delightful mountain air to breathe ; secondly, your eyes are gladdened, not only by the flowers, but by the glorious views of the great peaks ; thirdly, whether you are greedy or whether you are not, you have got to pretty well starve, and as regards your brain, if you have patience to learn the languages and mix with the people, you can find out a great deal about their points of view. So perhaps this hobby will help in pacifying the world—I hope so.

" The study of the plants, too, is very interesting. For example, finding out where they grow means a great deal of reading. Then there is the study of the type of ground in which you are going to find them, because that will teach you how to grow them. You may know certain plants grow in a certain range of mountains, but you may spend weary months and never find them at all, unless you know the type of ground on which you are likely to find them.

" Then there is the still more difficult job of growing them in your gardens when you have brought them back. The most delightful of the lot are called the relict plants ; they are the nobility, the plants of high lineage, of old ancestry, and they are particularly charming."

The lecturer had brought a number of interesting plants, which included *Anchusa caespitosa* from Crete ; presumably as the result of cultivation this plant, which is low growing in its native habitat, was now throwing up flowering sprays to the height of a foot or more. The rare *Anemone potentilloides* was also shown ; it is very small, with finely cut leaves and very dark blue flowers. The tiny *Rhodohypoxis rubella* has much smaller flowers than the better known *R. Baurii* and is too small to grow in the garden but is a very beautiful plant. *Campanula oreadum* has a huge blue trumpet-shaped flower.

A large number of slides, many of them taken in the plants' natural habitat, were shown and the lecturer commented on each picture as it appeared. *Anemone umbellata* (Fig. 74), from the Caucasus, a plant of very limited distribution, varies considerably in size ; Dr. GIUSEPPI's plant never grew more than 4 inches, whilst one collected by Mr. INGWERSEN on the same day is about 2 feet high. *Primula nivalis*, also from the Caucasus, awaits someone with patience to introduce it ; it grows on very high damp screes under the edge of the glaciers. *Fritillaria lutea*, again from the Caucasus, is yellow with black spots.

Draba bryoides var. *imbricata* grows right up on the snow line on Elbruz and all the rocks are covered with golden flowers. In the woods at the bottom of Dongus Orun grows *Daphne glomerata* ; the creamy flower is beautifully scented and the flower stems and bracts are purple red ; there are enormous numbers of flowers. At the foot

of Elbruz grows the Willow, *Saxix apoda*, whose stems are all underground ; Dr. GIUSEPPI scraped into the earth to get as many pieces as possible and by a lucky chance got both male and female plants.

Globularia illicifolia comes from Spain ; it grows between great boulders of limestone and bears delightful blue flowers. The edges of the leaves are prickly, like Holly.

Diosphaera is a queer plant to meet among the Campanulaceae ; there are two varieties in Greece and a third, *D. tubulosa*, as far away as Syria. On Chelmos grows *Diosphaera asperuloides* with minute spiny leaves ; it grows on the marble cliffs above the Styx, four or five large plants and that is all ; unless the one locality is known it is very difficult to find. Another plant growing on the Styx is *Teucrium aroanii*, which has long blue flowers and whitish leaves ; it makes mats on the white rocks above the river's channel. *Daphne oleoides* is common in Greece, Albania and Yugoslavia, it has clusters of snow-white flowers and is well worth growing.

One of the rare Saxifragas is *S. karaditsensis*, introduced to cultivation by Dr. GIUSEPPI, who found it on a mountain in the eastern part of Albania ; there are many other Saxifragas in that part of the world, including *S. Spruneri*, which should be grown more often.

Geranium subcaulescens is a wonderful sight ; the flower is brilliant red and on Korab there are hundreds of acres covered with it ; there were no colour forms to be found, though variations occur in cultivation.

Dianthus haematocalyx from Olympus is one of the nicest of the genus, the pink petals being brown underneath ; on the mountain the plants are 2 inches across, but in the garden it grows larger. Dr. GIUSEPPI has one measuring 1½ feet across with 150-200 buds on it.

Few Australian plants can be grown as alpinas ; for one thing they are not generally hardy, but *Stylidium adnatum* is really hardy ; it has bright pink flowers and projecting styles. When the style is touched it flashes up like the trigger of a revolver and fertilizes the flower. There is also the larger species, *S. graminifolium*, and the speaker has grown *S. caespitosum*, which is even more delightful but has smaller flowers.

Few people grow *Asperula arcadiensis*, but it is one of the most gorgeous of the Greek plants ; it hangs down great limestone rocks and is a wonderful sight with its pale pink flowers and lovely hairy leaves.

Conandron ramondiodes comes from Japan ; the flowers show a wide range of variation from darkest blue to snow white. Also from Japan is *Thalictrum kiusianum*, which has perfect pink "petals" ; *T. psilotifolium* (Fig. 75) has its leaves so modified that they look like light green hair, and *T. lotifolium* has lovely leaves like the Lotus from which it takes its name.

Lithospermum fruticosum has intensely blue flowers ; it grows on a sandbank off the Portuguese coast and is very rare in cultivation, all the plants available having come from four seeds which it took 1½ hours to find.

In Crete grows the very beautiful *Campanula saxatilis*, but in two spots only, on limestone rocks through which the Greeks have dug a canal. The water pours out into a basin where the women collect it for drinking, and the whole of that damp rock is completely covered with this gorgeous Campanula.

The little Daffodils are especially charming : *Narcissus scabarulus*

grows on a single mountain in Portugal, which is the land of these miniatures, though a few have spread into Spain and Morocco. *N. rupicola* has a large flower and comes from Spain, north of Madrid. *Thymus membranaceus* (Fig. 76) is an unusual Thyme with great white bracts out of all proportion to the small flower; some other species have blood-red and some purple bracts. It is a difficult plant to grow.

Ptilotrichum Baldacii was brought home by Dr. GIUSEPPI from the Albanian mountain, which is the only place where it occurs. *Campanula Hawkinsiana* has an unusual distribution; it is found on some of the great peaks in Epirus, and the torrents bring down the seed so that great mats of tiny leaves and enormous dark purple flowers are found growing in the bed of the stream that would be under water in the winter months. *Campanula Giuseppii* was discovered by the lecturer on Chelmos.

The high Alpine Violas are difficult to grow; *V. poeticus* occurs on one mountain in the middle of Greece, but is not in cultivation. *Viola delphinantha* is an extraordinary plant which does not look like a Viola at all. It is one of the relicts and is found on Athos, on Olympus and in Bulgaria. The leaves are narrow and divided into three, and the flower is pink; the plant is shrubby. In Yugoslavia on Jacupitsa and Solunska, the mountain peaks that held up the Germans, is *V. Koshanini*; the flower is about 1 inch across, pink, with a very long spur. No more of these relicts are found till *V. carzolensis*, which occurs in Spain; it has the same type of leaf divided into three, but a larger flower and spur, so that it looks like an Orchid. The peculiar distribution may be compared with that of the Ramondias which occur in the same countries—Bulgaria, Yugoslavia, Albania and Spain.

Rosa berberidifolia is found in the lower reaches of the mountains of Persia, the Rose that grows as firewood, with a lovely scent and golden flowers with black centres. From Persia also comes Dionysia, one of the first plants Dr. GIUSEPPI found on the mountains. *D. bryoides*, which received the Award of Merit in 1944, has lovely pink flowers and grows on one mountain, Kuh Ajub; it grows flat on the cliffs, the minute leaves forming tight rosettes, from which the flowers stand up on long tubes. On a neighbouring mountain, Kuh Bamu, is a yellow species, *D. Michauxii*, which has an even longer tube to the flower and hairy leaves. The most beautiful of all is *D. curviflora*, whose flowers are every shade of pink; it makes great clumps on the mountain slopes which one must walk on as there is no space between.

Two other Violas from Greece and Serbia are *V. Doerfleri*, which grows on Kajmachkalan and nowhere else, and *V. Grisebachii*, from the mountains of the Pindus Range and on the central Range in Yugoslavia. The former has pink, the latter blue flowers.

Microstachys tetragona from Tasmania is a naturally miniature Conifer. The cones are green at first, last a whole year and then turn brown; when they are fertilized they grow in size and are blood-red, a colour that lasts until they dry up and the ripe seed comes out.

Weldenia candida (Fig. 77) comes from Mexico; half a dozen plants were first introduced and anyone who had the luck to own one knew where the other five were. There are two forms, the other coming from Guatemala, and this is the larger of the two in leaf and flower. *Jankaea Heldreichii* is one of the Gesneriaceae with lovely blue flowers and a coating of white hairs on the leaves. There are great masses of this plant on Olympus; the form in cultivation has

woolly leaves, but there is another in which the leaves have shining silky hairs.

Cremanthodium Sherriffi from the Himalayas has flowers which start white, change to pink and end up red. *Didissandra grandis* (Fig. 78) from China is a lovely plant, the flower being a wonderful blend of colours and the leaves hairy.

These are all difficult plants to get and to grow. Perhaps it is the difficulty that induces most of us to grow them.

FOUR FRIENDS OF A HUNDRED YEARS (1845-1945).

A HUNDRED years ago ROBERT FORTUNE was in China, collecting plants for the Horticultural Society. This was his first Chinese journey. He went in 1843 and came back to England in 1846. On his return he was appointed curator of the Chelsea Physic Garden, but in 1848 he resigned and went again to China in order to introduce the Tea plant into India. This he succeeded in doing, and so laid the foundation of a great industry in our Indian Empire.

Lonicera fragrantissima was introduced by this great collector in 1845. As Mr. BEAN says, it is not a showy plant but it is very early and very fragrant. Its small creamy-white flowers appear from December to March. To my mind scent is indispensable in a Honeysuckle, and *Lonicera fragrantissima* has a good rich Honeysuckle fragrance. It is partially evergreen, varying according to the severity of the winter. It is best on a south or west wall, but it is perfectly hardy.

Indigofera decora was introduced by FORTUNE about the same time. He found it in the gardens of Shanghai. It is a native of Northern China and perhaps of Japan. It is still rare in gardens, though it is a charming little shrub, up to about a foot in height, freely bearing racemes of rose-pink Pea-like flowers all through the summer. It dies to the ground in winter.

Two other plants which can claim a centenary this year are *Rhododendron amoenum* and *Eucryphia glutinosa*.* *Rhododendron amoenum* is a native of Japan. When it was first introduced into England in 1845 it was treated as a greenhouse plant, but it is quite hardy at Kew, where it forms a neat slow-growing shrub from 2 to 4 feet high. It is a pleasing evergreen, profuse in its production of rosy-purple flowers in May. The calyx lobes resemble the corolla in shape and colour and so give the appearance of one flower growing out of another—"Hose-in-hose" as it is called.

Eucryphia glutinosa, formerly known as *E. pinnatifolia*, from its pinnate foliage which becomes bright orange and red during late autumn, was discovered by the Chilean botanist, GAY, in 1845, on the rocky banks of a river.

The *Eucryphas* have been called the *crème de la crème* of the shrub world. This one flowers in July and August and is one of the best and hardiest. The flowers are bowl-shaped, satin-white, filled with a mass of coral-tipped stamens. They are very fragrant. *Eucryphia glutinosa* likes a lime-free soil and to have its roots kept cool. In this

* *Rhododendron amoenum* and *Eucryphia glutinosa* are figured in the *Bot. Mag.*, t. 4728 and 7067 respectively.

climate, indeed, most of the beautiful shrubs from Chile are best in partial shade.

E. glutinosa is one of the parents of *E. Nymansay*, the other parent being *E. cordifolia*, which flowers rather later and is distinctly more tender. *E. cordifolia* is tolerant of lime and is of a more upright habit than *E. glutinosa*. *E. Nymansay* seems to combine most of the merits of both its parents. It was raised about 1915 as a natural hybrid in the garden of Lt.-Col. MESSEL at Nymans in Sussex—hence, of course, its name.

E. glutinosa is also one of the parents of another beautiful hybrid, *E. intermedia*, the other parent being a Tasmanian Eucryphia, *E. lucida* (Billardieri). *E. intermedia* originated in the garden of Ros-trevor House, Co. Down, and was awarded an A.M. on September 1, 1936.

E. glutinosa continued for a long time to be somewhat rare in England, as it was found difficult to propagate and to transplant. But more recently seeds have been produced in this country, and now it is readily obtainable. There is a semi-double variety which should be avoided.

J. W. HUNKIN.

RIMARIA HEATHII.

THE Mesembryanthemums of South Africa take many forms; a large number of them are small shrubs with succulent leaves, which in the Karroo, the area where the largest number of this genus occur, colour the landscape at flowering time with Daisy-like flowers of many colours.

But a number of the Mesembryanthemums exhibit a more extreme type of succulence and each pair of leaves is so swollen and grows so closely together that they appear, in the Lithops and Conophytums for instance, to form one top-shaped body with a slit across the top through which the flower emerges.

In *Rimaria Heathii* the union is not so complete; each leaf is almost hemispherical, and the two flat sides remain closely pressed together. The dried remains of the leaves of previous years form a collar below and clothe the short woody stems; quite big clumps are sometimes found but, like many of this type of Mesembryanthemum, they are not easy to see because they resemble their surroundings so closely. The Lithops look very much like the pebbles amongst which they grow; even simulating the colour so that those on iron-stone formations are reddish-brown, whilst others on quartz are paler and greener. *Rimaria* occurs as can be seen in Fig. 71, which is from a photograph by Capt. COLLINGWOOD INGRAM, taken in the Ladismith District, where there is quartz scattered over the surface. The contrast would not be so marked as the photograph indicates for the colouring of *Rimaria* is greenish-white like milky jade.

This plant was named after Dr. RODIER HEATH of Weymouth, who had a fine collection of succulent plants and grew the mimicry types especially well.

THE ORIGIN OF THE NAME "GREEN GAGE."

By A. SIMMONDS.

WHERE or when the Green Gage Plum originated is not known with certainty, but there is no doubt that it was cultivated in France during the reign of François I (1494-1547) and that it was called in honour of his queen "Reine Claude." Incidentally, that is the name by which the variety is still known on the Continent and also in America. In England, however, the variety acquired the name "Green Gage," and the object of this note is to correct the details of the commonly accepted story of the origin of the English name.

In his *Fruit Manual* (5th edit., 1884) HOGG says the variety "is said to have been introduced at the beginning of the last century by Sir Thomas Gage, of Hengrave Hall, near Bury St. Edmunds, who procured it from his brother, the Rev. John Gage, a Roman Catholic priest, then resident in Paris. In the course of time it became known as the Green Gage Plum." This appears to have been accepted at its face value by BUNYARD, for in his *Handbook of Fruits* (1925) he says "Imported into England by Sir Thomas Gage, hence the name in this country." Where HOGG got his information I do not know, but the following version of the story had appeared sixty years earlier in HENRY PHILLIPS'S *Pomarium Britannicum* (3rd edit., 1823): "This plum received the name of Green-gage from the following accident: The Gage family, in the last century, procured from the monastery of the Chartreuse at Paris, a collection of fruit-trees. When these trees arrived at the mansion of Hengrave Hall, the tickets were safely affixed to all of them, excepting only the Reine Claude, which had either not been put on, or had been rubbed off in the package. The gardener, therefore, being ignorant of the name, called it, when it first bore fruit, the Green Gage."

Now the only members of the GAGE family who conform to HOGG'S particulars are Sir THOMAS ROOKWOOD GAGE (1719?-1796), fifth baronet, and his brother JOHN GAGE (1720-1790) a priest of the Society of Jesus, but, as will be seen, they could not really have been the people involved. The Oxford English Dictionary gives 1759-65 as the earliest period for the use of the name "Greengage" and quotes as its authority an undated memorandum, written among other memoranda bearing dates ranging from 1759 to 1766, by PETER COLLINSON (1694-1768) and published in *Hortus Collinsonianus* (1843). The note runs:

"Mem.—'I was on a visit to Sir William Gage, at Hengrave, near Bury; he was then near 70; he told me that he first brought over, from France, the *Grosse reine Claude*, and introduced it into England, and in compliment to him the Plum was called the Green Gage; this was about the year 1725. P. Collinson.'"

The last sentence is ambiguous, but as, according to the *History and Antiquities of Hengrave*, Sir WILLIAM GAGE, second baronet, "died on the eighth of February, 1727, in his seventy-first year," it is evident that the sentence means that it was "about the year 1725" that COLLINSON was at Hengrave and had the origin of the name "Green Gage" explained to him. So the O.E.D. date for the first use of the name is too late, and that that is so is confirmed by PHILIP MILLER'S *Gardeners and Florists Dictionary* (1724), for "Green Gage"

occurs in it in a list of "Several Curious Sorts of Plumbs" in an appendix to Vol. II. Incidentally, the same list contains "Rein Claude," and although neither that name nor "Green Gage" is to be found among the fifty-nine Plums described in the body of the book, one of the fifty-nine descriptions is as follows :

"26. The Queen Claudia plum is also a sort of large, white Damask, almost round ; its Flesh is firm and thick, its juice is richly sugar'd ; it quits the Stone, and ripens pretty late, but is highly esteem'd."

No doubt PHILIP MILLER, who had charge of the Chelsea Physic Garden, knew more about medicinal plants than about fruit, which would account for his listing the same variety under three different names, but what he wrote agrees with PETER COLLINSON's memorandum and shows that the Plum was introduced before 1724 and was at that date known in this country not only by its original French name but also by two English names.

Now in 1724 (not to say earlier) HOGG's "Sir Thomas Gage" was a child aged five or six and his brother JOHN, who later became a Jesuit, was even younger, so it is evident that they could not have been responsible for the introduction of the Plum. On the other hand, PETER COLLINSON's "Sir William Gage" does fit the facts, for Sir WILLIAM GAGE, second baronet, who "died on the eighth day of February, 1727, in his seventy-first year, and [who] lies buried at Hengrave," was about sixty-seven years of age in 1724.

There is a tradition among the Jesuits that a Fr. GAGE sent the original tree to Hengrave. But if that were so, as we have seen, it could not have been the Rev. JOHN GAGE mentioned by HOGG. There was, however, an earlier Fr. JOHN GAGE (1651-1728), a "native of Suffolk," who may have been a relative of Sir WILLIAM GAGE, and the latter had a cousin JOHN GAGE, whose will, dated 13 January, 1718, was proved at Doctors' Commons 28 March, 1723, and who died unmarried in between those dates, but whether he was a Jesuit or not the *History and Antiquities of Hengrave* does not state.

Finally, it seems probable that in 1724 Sir WILLIAM GAGE was not the only, or even the first, person who had imported the "Green Gage" Plum, although it was after him that it was named.

LILY NOTES FROM NEW ENGLAND.

By WILLIAM N. CRAIG.

WAR conditions have not lessened the interest in Lilies in North America, although shortage of labour and other hindrances have somewhat cramped their commercial production and certain varieties, abundant not long ago, are now very scarce, including *Lilium candidum*, *L. speciosum* and *L. auratum*, the two latter having been all but unprocurable. Interest amongst amateurs has been well maintained and several new varieties of promise are still appearing.

In a land as broad as the United States we have very varied climates, but the greatest interest in Lilies is centred in the Atlantic and Pacific coastal areas ; Oregon in the West and New England, New York, New Jersey, Pennsylvania and Virginia in the East contain the great bulk of our Lily growers both private and commercial, with Oregon far the most important commercially. Vermont, with a severely cold winter

climate, is the most important New England state in production, and many fine hybrids have come from there ; more really good novelties have been produced there than in any other state in the union. Deep snow coverings through winter make it possible successfully to grow such varieties as *L. giganteum*, *L. sulphureum*, *L. japonicum* and even *L. ochraceum* there.

Our sister country Canada has also given us many grand new varieties from such cold locations as Ottawa, and Dropmore, Manitoba, to mention but two, where Miss PRESTON and Mr. F. L. SKINNER have raised many fine garden Lilies, fully the equal of anything produced in the U.S.A. Going to British Columbia, we find Mr. ALWYNE BUCKLEY, who hailed from Birmingham, England, raising *L. auratum* in hundreds of thousands, from seeds and bulbets in a wide range of types which he calls the "Esperanza" strain. He made splendid exhibits of these in Boston and New York last summer, sending large shipments for exhibitions in those cities by air mail. Mr. BUCKLEY gets sensational prices for some of his best forms, running as high as \$100-\$125 per bulb in some cases.

Excellent work has been done with our lovely native Lilies, especially by Mrs. NORMAN HENRY in Pennsylvania, who has been particularly successful in selecting and raising pure yellow and other lovely forms of *L. superbum*, *L. canadense* and other species. *Lilium canadense*, incidentally, is occasionally found in the wild with all the flowers yellow and unspotted, and I had a good-sized batch of these last summer, all yellow and spotless. *Lilium superbum* does notably well in Rhododendron beds where there is a constant heavy mulch of leaves. Last summer a friend in Falmouth, Mass., had two spikes 10 feet 5 inches and 9 feet 10 inches high, carrying respectively 89 and 105 flowers. Our most difficult native species to establish is *L. philadelphicum*, which is very abundant in the wild ; I have seen seven flowers on spikes in the wild but rarely got more than four in the garden.

In the East 'Shuksan' succeeds the best of Dr. GRIFFITHS's hybrids. Few of the other Pacific coast varieties have long staying powers in New England, growing sufficiently well to win applause for a year and then passing out.

Mr. DONALD SIMMONDS, born in England in 1902, who came to America when twenty years of age and had been acting as secretary to the Lily group of the American Horticultural Society for three years, had been working with *L. canadense* and *L. superbum* for a number of years and was doing grand work with this family, when he died last April, and did not live to see in flower the many fine selections which he had made of this family.

The American Horticultural Society, with headquarters in Washington, is hoping to strengthen its Lily committee this year and get out a Lily Year Book. This Society is comparatively small ; Washington horticulturally is relatively unimportant as compared with Philadelphia, New York and Boston, where there are old, strong and well-established horticultural societies. Boston for several years had beautiful Lily gardens at its great spring flower shows in March, one garden having no fewer than fifty varieties three years ago. Boston has had a Lily show in July for the past three years and has attracted exhibits from as far away as Oregon and Manitoba, and had sixteen classes allotted to them last July. Short talks on Lilies with discussions attracted good audiences each day.

Our summers here are very hot and it is rather difficult to time

exhibitions correctly, just as our distances are great and limit attendances. The Massachusetts Horticultural Society has definitely decided to hold a Lily exhibition in July each year. An exhibition was previously held in Virginia, while in late years Oregon has held exhibitions, but these are confined largely to such commercial cut-flower or potted varieties as *L. longiflorum*, *L. regale* and *L. formosanum*. The Massachusetts Horticultural Society with a special fund for Lilies would seem to be the most logical body to foster interest in Lilies.

Amongst new varieties recently introduced here Mr. LOUIS VASSEUR, Milton, Mass., has done yeoman work ; two new varieties of *L. umbellatum* certificated in Boston were 'Moonlight,' a very pleasing yellow, and 'W. N. Craig,' named for the writer of these notes, a clear spotless orange-yellow ; Mr. VASSEUR has produced other splendid crosses of which more will soon be heard. 'Seneca' from Mr. G. L. SLATE (son-in-law of the late E. H. WILSON), Geneva, N.Y., is another pleasing hybrid. Mr. SKINNER exhibited many fine new things in Boston last July, some of them equalling the best "Backhouse Hybrids." Speaking of the "Backhouse Hybrids," these latter succeed well over here, while we fail to have much success with the Martagons. *L. aurelianense* is growing steadily in favour here and is a fine Lily ; seedlings give a wonderful range of colours and forms, some ivory-white, others in various shades of yellow and orange.

There is a tendency to produce far too many Lilies which are red, orange and of bright colours, which the general public here does not warm up to ; we have intensely hot summers and under our glaring summer sun these colours are rather distressing, except in early summer and fall. In Great Britain, with your more subdued skies, the brilliant colours would be appealing, but here whites, yellows and pinks are most popular.

Of course we continue to have our troubles with Mosaic and Botrytis, but Basal Rot has of late assumed rather sinister proportions. I find that where there is excellent drainage and there has been previous treatment with a Hormodin powder, the bulbs are comparatively free from trouble. Sandy loam Lily Gardens, North Springfield, Vermont, find that an excellent disinfectant is a fine yellow powder called Spergon and use this for all choice bulbs. A very successful amateur grower in New Rochelle, N.Y., tells me that he uses one-tenth of one per cent. hydrogen peroxide (about an ounce to a quart of water) ; he saturates the ground with this solution without harm to any plants, and states that it will kill all anaerobic bacteria and fungi.

We are having a very severe and sustained winter in New England and all of the Eastern and Middle Western areas. Snowfalls for the winter to date total 80-120 inches, and in late February, as this is being written, we are still deeply buried in hard frozen snow, but this covering is all to the good for Lilies and many other plants.

DAHLIAS—A CORRECTION.

IN the article on Dahlias by H. STREDWICK (*R.H.S. Journal*, 70, p. 160), in considering the date of introduction, it was stated that "Mr. C. HARMAN PAYNE gives the date as 1789." Mr. PAYNE's family have pointed out that this statement is not correct ; this old error, which has been perpetuated in many works on the Dahlia, was corrected by Mr. PAYNE in an article in the *R.H.S. Journal* (42, p. 305, 1917). The

mistake is probably due to a printer's error in the second edition of *Hortus Kewensis*, for in AITON's *Epitome of the second edition of the "Hortus Kewensis"* the date has been changed to 1798. Attention is therefore called to Mr. C. HARMAN PAYNE's article, where the question of the date is fully discussed.

Mr. STREDWICK reports that growers in the north do not agree with his statement that "no Dahlia is any use planted in June"; he considers that the dates he gives for planting apply to the southern counties but may want modifying in cold districts.

THE AWARD OF GARDEN MERIT.—LXXIV.

320. APPLE 'ARTHUR TURNER.'

Award of Garden Merit, May 28, 1945.

IN small gardens where fruit trees are not segregated in a special plot or orchard, the decorative effect of the trees at flowering time may be considered as well as the usefulness of the crop they bear. 'Arthur Turner' is a useful early Cooking Apple, but the beautiful pink colour of its blossoms makes it also a fine ornamental tree when in flower; it is a strong grower and free bearer.

321. ASTER ACRIS.

Award of Garden Merit, April 16, 1945.

The Michaelmas Daisies now grown in such numbers are mostly hybrids which show considerable improvement, from the gardener's point of view, on their parents. Some of the Aster species, however, are valuable in the herbaceous border and amongst them is the South-European *Aster acris*, which grows to about 2 feet or more in height and produces a large number of flowers in close corymb. The ray florets are mauve and the disc is lemon-yellow, the whole flower-head being some 1½ inches across and rather starry. The flowering period lasts six or seven weeks, beginning about the end of August. There are several forms of this plant: var. *nanus* is smaller and more compact in habit and flowers several weeks later. The variety *dracunculoides* is a less valuable plant, being taller with narrower and paler ray florets. *Aster acris* is not particular about soil but does best in a rich, moist loam; it can be propagated by division.

322. PRIMULA CORTUSOIDES.

Award of Garden Merit, May 28, 1945.

Primulas are decorative plants of tidy habit, but not all will succeed in the garden without rather special treatment. *Primula cortusoides*, however, is an easy species which can be planted in the front of the herbaceous border, in the rock garden or used in the cold greenhouse. It comes from Western Siberia; the leaves form a rosette, each being soft and hairy, heart shaped at the base and irregularly notched. The flowers are about 1 inch across, rose-pink, and held in a loose umbel on a scape some 9-12 inches high. The plant does best in rich moist soils; its flowering period is in May.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

***Anchusa caespitosa*.** A.M. May 15, 1945. A handsome plant with gentian-blue (H.C.C. 42) flowers about $\frac{1}{2}$ inch across and hispid, linear leaves. Dr. Giuseppi, who introduced the plant from Crete, states that on its native mountains it is rarely more than an inch or two in height: the 15-inch stems of the specimen exhibited, which had been vegetatively propagated from the original collection, had resulted from generous cultural treatment. Exhibited by Messrs. Bees, Ltd., Sealand Nurseries, Chester. See p. xxxix.

***Calanthe nipponica*.** A.M. May 1, 1945. A hardy, terrestrial Orchid suitable for moist or boggy places in the woodland garden. The stout, erect stem, rising from a basal tuft of four or five lanceolate or oblong-lanceolate leaves, bears a spike of about sixteen flowers. The outer sepals are $\frac{3}{4}$ inch long, narrow-ovate, pale green; the lateral petals are similar but narrower; the lip is almost orbicular, fimbriate, brown in colour, flushed with yellow and rose. Exhibited by the Rt. Hon. Lord Swaythling, Townhill Park, Southampton. See p. xxxvii.

***Cypripedium parviflorum*.** A.M. May 1, 1945. This terrestrial Cypripedium is hardy and suitable for rock garden or alpine house; it comes from Canada and may be synonymous with *C. pubescens*, though, as the latter is a plant of the prairies and the former comes from damp, swampy woods, it may be worthy of varietal if not specific rank. The plant grows from 8 to 10 inches high, and has yellowish flowers with twisted sepals; it received a P.C. in 1944. Shown by H. Clifford Crook, 4 Alexandra Crescent, Bromley, Kent. See p. xxxviii.

***Dendrobium* × 'Adrasta.'** A.M. May 15, 1945. This primary hybrid bore numerous flowers of pale rose colour, the labellum of a deeper rose tint. The result of crossing *D. superbum* with *D. Pierardii*. Raised and exhibited by Messrs. Sanders, St. Albans. See p. xl.

***Lelophyllum buxifolium* var. *prostratum*.** A.M. May 1, 1945. The variety resembles the type except in its lower stature and more compact growth, which makes it especially suitable for the rock garden. It is covered in May with close corymbs of tiny pinky-white flowers, making a sheet of blossom about 6-8 inches from the ground. Shown by Dr. P. L. Giuseppi, Trevoise, Felixstowe. See p. xxxviii.

***Myrtus Lechleriana*.** A.M. April 17, 1945. This attractive ever-green shrub was collected by H. F. Comber in Valdivia, where it sometimes attains a height of over 30 feet. The ovate, acute leaves, bronzed-tinted while young, later become leathery and dark green, those on the flowering branches usually not over an inch in length. The numerous fragrant, creamy-white flowers are borne in few-flowered clusters crowded in the leaf-axils towards the apex of the branches. The species is figured at t. 9523 of the *Botanical Magazine*, where the small, reddish-purple berries, said to be very attractive to birds, are also shown. Exhibited by G. H. Johnstone, Esq., Trewithen, Cornwall. See p. xxxiv.

***Narcissus* 'Trousseau.'** A.M. March 20, 1945. A handsome bicolor trumpet variety (Division 1c) with a shapely flower $4\frac{1}{2}$ inches in diameter, well poised on a stout 19-inch stem. The milk-white, smooth, broad, over-lapping perianth segments were $1\frac{1}{8}$ inch long, the outer ones being $1\frac{1}{2}$ inch broad. The neat, Naples yellow (H.C.C. 403) corona, expanded at the mouth and indented at the

margin, was $1\frac{1}{4}$ inch long and $1\frac{1}{2}$ inch in diameter. This variety, which received *Preliminary Commendation* in 1939, was raised by the late P. D. Williams and shown by Mr. J. L. Richardson. See p. xxxii.

Odontoda \times 'Zeta' var. 'Nobility.' A.M. May 15, 1945. The spike bore twenty-one well-formed flowers, in colour Venetian red, the segments bordered with rose. The result of crossing *Oda*. 'Columbia' with *Oda*. 'Esme.' Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. See p. xl.

Prunus serrulata 'Pink Perfection.' A.M. April 17, 1945. A very handsome Cherry, raised by the exhibitors from a seed of the fine white variety 'Okumiyako.' The pollen-parent is believed to be 'Kwanzan,' which the new variety closely resembles. The flowers are about 2 inches across, with from twenty-five to thirty oblong or obovate, irregularly-notched petals, and are borne in peduncled clusters of five or six on stalks $1\frac{1}{2}$ inches long. The colour of the fully-expanded flower is rhodamine pink (H.C.C. 527/2-3). Exhibited by Messrs. John Waterer, Sons, & Crisp, Ltd., Bagshot. See p. xxxv.

Rhododendron 'Alison Johnstone.' A.M. April 17, 1945. An interesting hybrid between *R. yunnanense* and *R. concatenans* which has medium-sized trusses of 9-10 flowers with slender tubes and smooth-edged, round lobes, about $1\frac{1}{2}$ inch wide; the colour is amber flushed with pink, and there are no markings. Shown by G. H. Johnstone, Esq., Trewithen, Cornwall. See p. xxxvi.

Rhododendron 'Aspansla.' A.M. April 17, 1945. This hardy shrub is useful for the rock garden as it retains the dwarf and spreading habit of its parent *R. haematodes*; the other parent is *R.* 'Astarte' (*R. dichroanthemum* \times *R.* 'Penjerrick'). It has large bell-shaped flowers of brilliant red (H.C.C. 820) with a very large, petaloid corolla of the same colour, there being 8-9 flowers in a truss. Shown by Lord Aberconway, Bodnant, N. Wales. See p. xxxvi.

Rhododendron 'Carita.' A.M. April 17, 1945. The parents of this fine hybrid are *R. campylocarpum* and *R.* 'Naomi'; it bears trusses of 12-13 large flowers whose colour is very pale primrose (H.C.C. 64/3), the pedicels being pink. Shown by Major E. de Rothschild, Exbury, Southampton. See p. xxxvi.

Rhododendron 'Dot.' A.M. April 17, 1945. This hybrid between *R.* 'Mrs. Lindsay Smith' and *R. Fortunei* has large white flowers 4-5 inches across, making handsome trusses. Shown by the Rt. Hon. Lord Swaythling, Townhill Park, West End, Southampton. See p. xxxvi.

Rhododendron 'Golden Horn.' A.M. May 1, 1945. The parents of 'Golden Horn' are *R. dichroanthum* and *R. Elliottii*; the trusses contain up to ten trumpet-shaped flowers of a bright red colour (H.C.C. 18/1). Shown by Major E. de Rothschild, Exbury, Southampton. See p. xxxviii.

Rhododendron 'Idealist.' A.M. May 1, 1945. This hybrid between *R.* 'Naomi' Exbury var. and *R. Wardii* has bold trusses of ten to twelve wide campanulate flowers which are very pale greenish-yellow (H.C.C. 663/2). Shown by Major E. de Rothschild. See p. xxxviii.

Rhododendron sp. *Irroratum* Series. A.M. May 1, 1945. This has a very lovely truss of shallow, campanulate, white flowers, about 2-2 $\frac{1}{2}$ inches across, with a pattern of crimson dashes on the upper petals. Shown by Major E. H. Savill, Windsor Great Park. See p. xxxviii.

Rhododendron 'Ivanhoe.' A.M. May 15, 1945. This hybrid between *R. 'Chanticleer'* and *R. Griersonianum* has fine trusses of wide campanulate flowers, about $3\frac{1}{2}$ inches across, of a brilliant red colour (H.C.C. 020), very faintly mottled on the upper petals in a darker shade of the same red. Shown by Major Edmund de Rothschild, Exbury, Southampton. See p. xl.

Rhododendron 'Matador.' A.M. April 17, 1945. A hybrid between *R. strigillosum* and *R. Griersonianum*, 'Matador' has the habit of the first parent but flowers later; the flowers are brilliant dark red (H.C.C. 721/1), carried 7-8 to the truss. Shown by Lord Aberconway. See p. xxxvi.

Rhododendron saluenense. A.M. April 17, 1945. A fine species for the Alpine garden, this plant comes from the Salween River; it is covered with small, shallow, wide open flowers, dark mauve-purple in colour (H.C.C. 29/1), and is quite hardy. Shown by Major E. de Rothschild. See p. xxxvi.

Rhododendron 'White Beauty.' A.M. April 17, 1945. The trusses of this hybrid are elongated and carry about 12 pure white flowers; its parentage is *R. 'Albino'* \times *R. Loderi* 'Pink Diamond.' Shown by W. J. Whitaker, Pylewell Park, Lymington, Hants. See p. xxxvi.

Richardia Rehmanni. A.M. May 15, 1945. An uncommon South African 'Arum Lily' differing from other species in its erect, lanceolate leaves, which are about 18 inches long and frequently marked with narrow white blotches, and in its pale, rose-pink flowers. The spathe is about 5 inches long, tubular below, with recurved margins and tip. Exhibited by the Duke of Richmond and Gordon, Goodwood, Sussex. See p. xxxix.

Saxifraga cehennensis. A.M. May 15, 1945. A pretty, late-flowering mossy species from the Cevennes, forming a dense hummock of tiny rosettes composed of 3- to 5-fid, glandular, slightly aromatic leaves $\frac{1}{4}$ inch long. The round, white flowers, about $\frac{3}{8}$ inch across, are carried four or five together on erect stalks 3 inches high. Exhibited by Dr. P. L. Giuseppi, Treviso, Felixstowe. See p. xxxix.

Vuykstekeara \times 'Adria.' A.M. May 1, 1945. A distinct tri-generic hybrid between *Miltonia* 'Lycaena' and *Odontioda* 'Rona.' The spike bore four flowers, the sepals and petals reddish, the labellum rose-coloured. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. See p. xxxvii.

Wilsonara \times 'Coriola.' A.M. May 1, 1945. This interesting tri-generic hybrid bore a tall spike with ten flowers, the well-formed segments purplish-rose with a violet tinge. The result of crossing *Odontioda* 'Apiola' with *Oncidium corynephorum*. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. See p. xxxvii.

Wistaria venusta. A.M. May 1, 1945. This very distinct, white-flowered species was first introduced into England in 1912, and is well figured at t. 8811 of the *Botanical Magazine*. The large, slightly fragrant flowers are borne on stout, spreading pedicels in pendulous racemes about 8 inches long. The pinnate leaves are usually between 8 and 14 inches long, with from eleven to fifteen oblong-ovate, downy leaflets, each $2\frac{1}{2}$ to 3 inches long. Exhibited by Messrs. Notcutt, Ltd., Woodbridge, Suffolk. See p. xxxvii.

BOOK NOTES.

"Ploughman's Folly." By E. H. Faulkner. Sm. 8vo. 142 pp. (Michael Joseph Ltd., London, 1945.) 8s. 6d.

Criticism of long-existing practices is not to be despised; because an operation has always been done one way is no guarantee that it is the right way. One should therefore approach such a book as "Ploughman's Folly" with an open mind; but one is at least entitled to ask that good evidence should be presented to prove that the new method being offered really is based on sound premises. The so-called experiments on which the author bases his theories were hardly carried out with the precision usually demanded for scientific work, nor with the usual "controls" and the results are capable of various interpretations. It is possible that there are cases where the use of the disc harrow to incorporate green manures is better than the use of the plough, but the sweeping and unconfirmed assertions of an enthusiast can at best only be suggestive; so dogmatic a statement as "Principles which are valid in the forest are valid in the field, always," while indicating that the author might do well to study ecology, will make the farmer cautious of discarding his plough until more scientific investigations have been made by workers with a better knowledge of the processes involved. "Ploughman's Folly," according to the note on the cover, has "aroused an agricultural controversy" in America which seems to have had an excellent effect on the sales of the book. Doubtless interest will also be aroused in this country; anyone growing crops for profit would be only too glad to be able "to take advantage of the weather, rather than to be always its victim," but when the author himself has to confess that during his experiments "each of these crops was handicapped by weather conditions" one may be forgiven for doubting if the change from plough to disc harrow will prove the panacea for all ills that it is claimed to be.

"Diseases of Vegetables." By Lawrence Ogilvie, M.A., M.Sc. 8vo. 74 pp. Illus. Bulletin No. 123, 2nd edition. (H.M. Stationery Office, 1944.) 1s. 6d.

This Bulletin is a revision and expansion of Bulletin No. 68 (2nd edition, 1935) and appeared in 1941, since when it has been twice reprinted and is now revised. It gives a full summary of the diseases to which garden crops are subject and measures for their control.

"The Flora of Uig." Edited by M. S. Campbell. Small 8vo. 63 pp. Illus. (T. Buncle & Co., Ltd., Market Place, Arbroath, 1945.) 10s. 6d.

The expedition described in this work was undertaken in 1939 to investigate a tract of country in the Outer Hebrides which had received little previous attention. The findings are given here, the Vascular Plants having been listed by M. S. Campbell and chapters on the Vegetation and on Systematic Notes being added by A. J. Wilmott. Owing to the death of C. V. B. Marquand the Bryophyta have not yet been dealt with, but the Lichens have been determined by I. M. Lamb and the Algae by Miss L. Lyle and A. Gepp. A map of the parish of Uig is included and several photographs showing the type of country.

"British Trees in Winter." By F. K. Makins. Small 8vo. 56 pp. Illus. (J. M. Dent & Sons, Ltd., 1945.) 7s. 6d.

Much land has been, and more will be, planted in this country with trees intended to supply wood for various purposes so that foresters and timber merchants, as well as the layman, will want to be able to recognize growing trees. When in leaf identification is not difficult, and the author's earlier book, "The Identification of Trees and Shrubs," is a great help to that end, but in winter recognition of bare branches is not so easy; the present book will be found helpful as, besides the written descriptions, line drawings are given and a number of photographs showing the habit of the trees and the type of bark. In all twenty-six different trees are described, some of which are native, others commonly grown for commercial purposes.

Books noted in this JOURNAL can be obtained direct from the publishers or through any bookseller; the R.H.Society's Office supplies only those books and pamphlets which have been issued by the Society.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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MESSAGE FROM THE PRESIDENT.

SUBSCRIPTIONS.

By Chapter III of the Bye-laws scheduled to the Royal Charter of the Society, there rests on the Council the onerous responsibility of deciding the amount of the annual subscriptions of the Fellows, Associates and Affiliated Societies.

It will have been realized by the subscribers that post-war conditions have already increased, and will continue still further to increase, the cost of the Society's activities. There have to be faced rises in salaries, though moderate in themselves, and especially rises in wages, in the cost of publications, and in general administrative expenditure, ranging from fuel to postage stamps.

After careful consideration of the range of future expenditure, the Council realizes that it has to adopt one of two alternative courses, either to increase the subscriptions, or drastically to curtail the Society's activities.

The Council is of opinion that if the second alternative were adopted, Wisley Gardens with their important trials and demonstrations must suffer severely, as also would the literary, scientific and educational portions of the Society's work, leaving the Society to be little more than a show-holding organization. Even then income would not balance expenditure unless and until there was attained such an increase in the numbers of subscribers as could hardly be hoped for.

On the other hand, if the policy of higher subscriptions were adopted, even if the number of subscribers was somewhat reduced, as might naturally be the result, funds would be available to enable the Society to maintain its high standard and fully to achieve its aim of improving horticulture, and of carrying on education in the broader sense, by example and research at Wisley, and by its publications and examinations, all controlled by staffs of recognized knowledge and ability.

The Council has therefore decided that the minimum subscription of a Fellow shall be two guineas, and that the additional privileges of the former two-guinea Fellow shall cost three guineas. Correspondingly Associates will pay one guinea and Affiliated Societies two or three guineas.

I could myself have wished that the increase in the subscription rate could have been postponed for a few months until the new subscriptions covered the entry to a post-war Chelsea Show, which we hope to hold in 1947. Such postponement, however, would entail a further substantial depletion of the Society's accumulated reserves. At the same time, it must be borne in mind that the programme for 1946 should compare not unfavourably with those provided in the years before the war.

I hope and believe that the great majority of subscribers will continue to support the Society in spite of the increased subscriptions, and that the Society will thus be enabled, in the future, as in the past, to hold, by merit and not only in numbers, its distinguished position as the leading Horticultural Society of the world.

ABERCONWAY,
President.

PROPOSED CALENDAR, 1946.

Meetings with Shows will be held on the following days :—

February 19, 20. March 12, 13 and 26, 27. April 16, 17 and 30. May 1; 14, 15 and 28, 29, 30. June 18, 19. July 2, 3; 16, 17 and 30, 31. August 13, 14. September 10, 12 and 24, 25. October 8, 9 and 22, 23. November 5, 6. December 3, 4.

The Annual General Meeting will be on February 19, and particulars of competitions at the various Shows will be announced in subsequent numbers of the JOURNAL.

PRIVILEGES OF FELLOWS AND ASSOCIATES AND NEW TERMS OF SUBSCRIPTION.

FELLOWS.

A Fellow subscribing Four Guineas a year (or commuting for Forty Guineas) is entitled :—

1. To ONE Non-transferable Personal Pass and FIVE Transferable Tickets admitting to all the Society's Meetings, and up to the Gardens.
2. To vote at all Meetings of the Society.
3. To attend the Lectures.
4. Admission to the Society's Gardens at Wisley.
5. To the use of the Library at the Society's Hall.
6. To a copy of the Society's *Journal* issued monthly.
7. To a share (in proportion to the annual subscription) of such surplus seeds as may be available for distribution. Fellows residing beyond a radius of 35 miles from London (by the A B C Railway Guide) are entitled to a double share.
8. Subject to certain fees and limitations, to obtain Analysis of Manures, Soils, etc., or advice on such subjects, by letter from the Society's Laboratory at Wisley.
9. To have their gardens inspected by the Society's Officer at the following fees : One day £3 3s., two days £5 5s., *plus* all out-of-pocket expenses.

10. To exhibit at all Meetings, and to send seeds, plants, etc., for trial to the Society's Gardens.

11. To purchase at reduced rates, such fruit and vegetables as are not required for the experimental purposes of the Society.

12. To recommend any Lady or Gentleman for election as a Fellow.

A Fellow subscribing Three Guineas a year (or commuting for Thirty Guineas) is entitled :—

1. To ONE Non-transferable Pass and Two Transferable Tickets.

2. To all the other privileges mentioned in Nos. 2 to 12 above.

A Fellow subscribing Two Guineas a year (or commuting for Twenty Guineas) is entitled :—

1. To ONE Transferable Ticket (in lieu of the Non-Transferable Personal Pass), and all the other privileges mentioned in Nos. 2 to 12 above.

ASSOCIATES.

An Associate subscribing One Guinea a year is entitled :—

1. To ONE Non-transferable Pass, and to privileges mentioned in Nos. 3, 4, 5, 6 and 10 above.

The Council may elect as an Associate any *bona fide* gardener or employee in any public or botanic garden, nursery, market garden or seed establishment who may be recommended by two Fellows of the Society, one of whom must be personally acquainted with the candidate. Forms may be had from the Secretary.

THE SECRETARY'S PAGE.

Subscriptions, 1946.—The attention of Fellows, Associates and Affiliated Societies is particularly drawn to the President's message on page 249, on the subject of the increase in subscriptions.

The Secretary will be sending out special letters in respect of this increase, and it is asked that prompt attention should be given to these letters in order to assist the Society's administration to deal with them quickly, and to cause as little inconvenience as possible.

Programme of Meetings.—There will be a Meeting on Tuesday, September 11 (12 noon to 5 P.M.), when there will be a competition for Cacti and Succulents and one for Flower Arrangements for Amateurs. Entry forms for these competitions are obtainable on application to the Secretary, R.H.S. Offices, Vincent Square, Westminster, S.W.1. On September 11 there will also be competitions for Alpine plants arranged under the auspices of the Alpine Garden Society. On this occasion there will be a lecture at 2.30 P.M. in the Lecture Room of the Society's New Hall, Greycoat Street, S.W.1, by Mr. F. P. Knight, entitled "Vegetative Propagation of Flowering Trees and Shrubs." The National Dahlia Society will be holding a competition for Dahlias in conjunction with the Show, and there will also be a competition for Early-flowering Chrysanthemums, organised by the National Chrysanthemum Society, on this occasion. Demonstrations of Control of Chrysanthemum Eelworm by warm water treatment, at 2.30 P.M. and 3.30 P.M., will be given on September 11 also.

Fruit and Vegetable Show.—The Fruit and Vegetable Show will be held on Tuesday, October 2 (12.30 P.M. to 5 P.M.) and Wednesday, October 3 (10 A.M. to 5 P.M.), and schedules are now obtainable on application to the Secretary. On October 2, at 2.30 P.M. in the Lecture Room of the New Hall, Dr. T. Wallace will give a lecture

on "Practical Aspects of the Manuring of Fruit," in conjunction with the Fruit Group. At this Show there will be a competition for Perpetual-flowering Carnations, under the auspices of the British Carnation Society, and a competition for Chrysanthemums, held by the National Chrysanthemum Society.

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during September and October

Sept. 19, 20.	Harvesting and Storing	2-4 P.M.
Sept. 27.	Control of Chrysanthemum Eel-worm by warm water treatment	2-4 P.M.
Oct. 10, 11.	Digging, Trenching, Manuring and Composting	2-4 P.M.

Fellows and Associates desiring to attend should notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, of their intention. Notification is essential for the demonstration on September 27 as, owing to the issue of special invitations to interested persons, the attendance will be large.

Rose Show.—The National Rose Society will be holding a Show in the Society's Old Hall on Friday, September 21 (12 noon to 6 P.M.) and Fellows will be admitted free of charge, on presentation of their R.H.S. tickets.

WISLEY IN SEPTEMBER.

As autumn approaches a change comes in the character of the floral attractions of the Gardens; and while there is a less abundant display of flowers in the Rock garden and borders, the standard collections of late-flowering herbaceous plants continue to provide plenty of colour and variety.

Among the Dahlias, for example, there are novelties such as the large, red semi-cactus 'Boldness' and 'Warden Oom' of bright sulphur-yellow side by side with 'Bishop of Llandaff,' 'Crimson Flag,' and some of the 'Star' varieties which were popular nearly a quarter of a century ago. Then there are border Chrysanthemums to suit all requirements. In addition to the larger-flowered kinds such as 'August Pink' and 'Gladiator' which require disbudding, and others like 'Wendy' and 'The Ashes' allowed to flower in the spray, there are varieties of the popular 'Lilliput' type forming floriferous bushes scarcely a foot tall, and several of the old-fashioned 'Pompon' forms.

In the same part of the Gardens the collection of Colchicums includes some of the best large-flowered varieties such as 'Violet Queen,' 'Daendels' of light rosy-lilac, the rich purple *speciosum atro-rubens*, and *speciosum album* with pure white flowers of great substance. Drifts of these are conspicuous at the west end of the Pinetum and in the Azalea garden, where they harmonize agreeably with the autumnal colouring of adjacent shrubs.

In the herbaceous borders the bold groups of Rudbeckias, Solidagos, Helianthus and Michaelmas Daisies are very conspicuous at this season. Some other outstanding plants are the varieties of *Anemone japonica* with gracefully poised, pink or white flowers, *Chrysanthemum rubellum*, a single-flowered species as valuable for cutting as it is for garden decoration, *Clematis heracleaefolia*, with clusters of small, lilac flowers, the tall scarlet or purple Lobelias, and the attractive semi-dwarf variety of *Physostegia virginiana* called 'Vivid.'

Gentians are prominent among the plants still flowering in the Rock garden. Along the top walk one may expect to find *G. Farreri* opening sky-blue trumpets, and the darker *G. Veitchiorum*. The popular *G. sino-ornata* will be producing the first of a long succession of blooms, and there are also *G. Macaulayi* and other noteworthy hybrids. *Calamintha nepetoides* and *Satueria subspicata* are bushy, free-flowering Labiates whose lilac blossoms are very attractive to bees. Some other good plants are *Zauschneria californica* with vermilion flowers like small Fuchsias, *Polygonum vacciniifolium*, draping the larger rocks with neat foliage and numerous pale pink spikes, *P. Reynoutria*, larger and bushy, with ornamental crimson fruiting sprays, and *Sedum cauticum*, whose purplish flower-heads tone well with the dull grey leaves. Near the bog one may see *Nandina domestica*, a small shrub with bronze-tinted, pinnate leaves and plumes of ivory blossoms, and *Kirengeshoma palmata*, bearing bell-shaped, butter-yellow flowers above handsome lobed foliage. In several parts of the Rock garden, as well as in the beds near the Alpine house, Crocuses begin to appear before the end of the month. The graceful violet *C. nudiflorus*, *C. speciosus*, daintily pencilled, and the orange-throated, lilac *C. zonatus* are the first of a long series.

Some of the shrubs in the Seven Acres collection are already showing their characteristic autumnal colours of leaf and fruit. The species of *Euonymus* are noteworthy, *E. alatus* for the rather fleeting, fiery red of its foliage, *E. yedoensis* and the forms of *E. europaeus* for their abundant pink capsules and contrasting scarlet seeds. *Viburnums* also exhibit a considerable range of form and hue. Among those whose chief value lies in their fruits *V. betulifolium*, *V. lophophyllum* and the varieties of *V. Opulus*, including the apricot-berried variety *xanthocarpum*, are important. *V. alnifolium* and *V. tomentosum* var. *Mariesii* are conspicuous in their autumn garb of crimson and claret, and many others show a pleasing change of colour before leaf-fall. Towards the end of the month *Prunus Sargentii* and *Parrotia persica* will be brilliant, and many fruiting trees and shrubs, including the Crabs and many *Berberis* species, will be at their best.

In the Heath garden the greatest interest is provided by the varieties of *Erica vagans*, the Cornish Heath, varying in colour from the white of 'Lyonesse' to the bright pink of 'St. Keverne' and the cerise of 'Mrs. D. F. Maxwell'; and also in habit, the variety *grandiflora* having spikes of unusual length. The Irish Heath and the varieties, both single and double, of the common Ling, are also very good now.

Howard's Field is worth a visit at this season, for many of the Rose species are in ripe fruit. Bottle-shaped, crimson or scarlet 'hips' adorn the arching sprays of *R. Sweginzowii* and *R. Moyesii*, *R. pomifera* has fruits like large, red Gooseberries, while those of *R. altaica* are black and glossy.

Among the crops attaining maturity in the vegetable trial ground there will be Tomatoes raised from seeds received under the Lease-Lend scheme, including well-known English kinds like 'Market King' and 'Kondine Red.' Spring-sown Onions from both English and American seed will be fully grown and ready to harvest, and the summer and autumn Cabbages grown from home-produced seed will have reached usable size.

GARDEN WORK.

REMINDERS FOR SEPTEMBER.

Vegetable Garden.—Continue to earth Celery as this becomes necessary, keeping a sharp watch for Celery Fly and Rust. Thin the seedlings of late-sown crops as soon as they become large enough, afterwards hoeing between the rows. In order to keep Runner Bean plants in a fruitful condition make a point of examining them frequently, gathering all pods before the seeds can be seen. Examine Cauliflower curds from time to time, protecting them from sun or frost damage by detaching a few of the outside leaves and placing them over them. Every effort should be made at this time to control Cabbage Caterpillars should they prove troublesome.

To provide Turnip "tops" for spring supply, early in the month make a sowing of 'Green Top Stone'; sow sparingly and later thin the seedlings to about 3 inches apart.

Early in the month, where cloches or movable frames are available, it is a good plan to mark out a plot of corresponding size in the open garden and make a sowing of a quick-maturing Lettuce for early winter use. The cloches or frames can be moved in position at a later date when required.

About the middle of the month plant Cabbages for spring supplies; ground recently cleared of Onion or Potato crops is admirable for this purpose. No further preparation is necessary beyond hoeing or lightly forking the surface before planting.

If suitable types of cloches are available, detach Tomato plants from their supports and lay them on a bed of straw; cloche at the first sign of frost, which usually occurs about the end of the month. Another method is to pull up the plants with the remaining green fruits attached, and transfer to a suitable place under cover to finish ripening. Fully developed green fruits can also be wrapped in paper and placed in a cupboard or drawer to ripen.

As soon as the foliage of spring sown Onions shows signs of ripening, turn this over to the shady side of the bulbs in order to obtain the full ripening effect of the sun; about a fortnight later the bulbs should be ready for lifting, and, if necessary, they should be transferred to a position where they can be thoroughly dried before being placed in winter store.

When the foliage of Haricot Beans has turned yellow, the plants should be pulled up and tied in small bundles, suspending in a suitable place to complete the drying of the beans.

Tubers of early Potatoes which have completed their growth should be lifted and stored in a cool, dark place from which they can be used before the maincrop variety. It is important not to delay this operation on soils where wireworms are troublesome.

Towards the end of the month, should frost threaten, Marrows intended for storing should be cut and placed in a suitable store, preferably where the temperature is not too low.

Fruit Garden.—Recently planted Strawberries should not be allowed to suffer from lack of moisture, and all runners should be removed immediately they develop, endeavour to build up strong crowns before the plants cease growing for the season.

In those instances where it is considered necessary to prune Cherry or Plum trees, the present is a good time for this operation; all stone fruits appear to resent cutting when the trees are dormant.

As soon as the fruit has been gathered, cut down to ground level fruiting canes of Loganberries and cultivated Blackberries; these can be replaced by a corresponding number of young shoots made this summer, cutting out the surplus ones. The strong-growing Blackberry 'Himalayan Giant' requires rather different treatment, as it will fruit on two-year-old shoots if the laterals on these are cut back to two or three buds. To obtain the best results from autumn-fruiting Raspberries the shoots should be supported and any surplus ones removed.

Towards the end of the month Gooseberry bushes attacked by American Gooseberry Mildew should have the tips of the diseased shoots removed; burn the infected prunings immediately.

Gather the earlier varieties of Apples and Pears as this becomes necessary; in order to know when to gather, a good test is to raise a few of the fruits gently to a horizontal position and should the stalks of the fruits part readily from the spurs they are considered ready. Often only a portion of the fruit on a tree will be ready for gathering, in which case it will be advisable to pick the remaining fruits as they become fit, thereby extending the useful season of a particular tree. Defer the picking of late varieties as long as possible or they will shrivel in store; next month is early enough for gathering the late varieties. When gathering the fruit avoid bruising by careless handling. It is advisable to use a basket lined with wood-wool for transporting the fruit to the store. Only sound fruit should be stored, imperfect and bruised specimens should be put on one side for immediate use.

If not already done, the fruit store should be thoroughly cleansed in readiness for receiving the fruit. Failing a proper store, place the sound fruit in trays or on shelves in a cool, dark place where a steady low temperature can be maintained and the atmosphere is not too dry; provide a little ventilation for about a fortnight after gathering, but avoid draughts.

Dig out useless fruit trees and bushes as soon as the crops have been gathered, and, if it is intended to replant during the coming autumn, order new ones immediately from a reliable nurseryman who specializes in raising fruit trees.

Flower Garden.—The present is a good time to prepare the ground for a herbaceous border in order to allow time for the soil to settle before planting next month.

If the soil is moist, the early part of this month is a good time to sow grass seeds to form a new lawn. When seeds are sown in autumn the growth is generally more sturdy and the young plants become thoroughly established and are not so liable to feel the effects of drought the following summer as when seeds are sown in spring.

On well drained soils, in favoured localities, sow hardy annuals, such as Calendula, Candytuft, Nigella, Larkspur, etc., and Opium Poppies to overwinter and flower early next season.

Plant *Iris unguicularis (stylosa)* in well-drained soil in a sunny position and should it be necessary to transplant Kniphofias, Paeonies and Eremuri, the present month is considered the best time for autumn planting. It is also a good month in which to plant evergreens; water freely at planting time and, if necessary, syringe overhead during periods of dry weather.

Most Roses, especially ramblers, root from cuttings inserted at this time of the year. Select well-ripened shoots which have flowered this season, about 6 to 8 inches in length, retaining a heel if possible;

remove the lower leaves and unripe tip and insert firmly to the depth of about 4 inches in well-drained soil in the open garden.

Towards the end of the month *Chrysanthemums* growing in pots which have their flower-buds well advanced should be placed in a cool, well-ventilated greenhouse; those planted in the garden may be lifted and treated likewise.

If not already done, order hardy trees, shrubs and roses, if required for autumn planting.

Cold Greenhouses and Frames.—About the third week sow seeds of an early-maturing Cauliflower, such as 'First Crop' or 'Forerunner,' in a cold frame, and, as soon as the seedlings are large enough, prick out about 3 inches apart in a similar position.

Sow seeds of Lettuce 'Gotte à Forcer' early in the month and again towards the end to mature in frames for autumn and early winter cutting.

Sow seeds of *Antirrhinum* about the middle of the month to raise plants to overwinter for planting out in spring for early flowering.

Violets should now be transferred to frames for producing flowers during the winter.

Continue to pot or box bulbs for spring flowering.

Select unflowered shoots from the centre of *Viola* plants and prepare as cuttings, inserting them in a sandy compost, either in boxes or direct into cold frames.

The mature seed heads of Onions and Leeks can be cut and placed in a greenhouse or frame, where difficulty is experienced in ripening.

Where the crop of Tomatoes growing in cold houses is becoming exhausted the plants should be cleared and the houses thoroughly cleaned before the end of the month in readiness to receive *Chrysanthemums* or any other crops which are to occupy them.

Grapes in cold houses will now be ripening, endeavour to keep a free circulation of air at all times and gradually reduce damping down in order to promote a drier atmosphere. Make a point of examining the bunches at least once a week in order to remove any rotting berries which may exist.

Continue to syringe the foliage of Peach and Nectarine trees, and never allow the border to suffer for lack of moisture. Maximum ventilation at all times should be maintained.

EMBOTHRIUM COCCINEUM.

LORD ABERCONWAY has been luckier than most people in finding this plant withstood 34 degrees of frost last winter (*R.H.S. Journal*, 1945, p. 191). I cannot trace the exact locality or altitude in Chile where it occurs in nature. Can anyone say? I think Lord ABERCONWAY must have got a much harder form than the one generally grown. Several plants died here on various occasions, having been placed in what I thought were good situations. In 1935 I got the Rostrevor form from that place; it died last September, in a sheltered position. One sucker was left, but it got a bad touch last January when we had 26 degrees of frost. Another smaller plant of the type was also damaged. Nearly all Chilean plants are hardy here except the *Embothriums*.

Londonderry.

COMD. F. GILLILAND.

IRISES FOR THE LITTLE GARDEN.

By MISS L. F. PESEL.

(Résumé of Lecture given on May 29, 1945; Mrs. Gwendolyn Anley in the Chair.)

THE title "Iris for the Little Garden" suggests that I am probably addressing beginners in Iris cultivation. At the White House, Winchester, where I now live, I have only a small garden, two-fifths of an acre of ground, including the house and garage. In my garden at Church Farm, Twyford, I had plenty of space for long beds and room for experiments. It does not matter, however, whether the garden is small or large, the same problems arise and the same general rules have to be observed.

Lay-out.—The general lay-out is the first point to be considered. Looking from the house the garden should show that it had been planned in relation to the house. If the garden is close to the house, it should form one picture with the house.

If, however, the Iris garden is away from the house and is seen only when the Irises are in bloom, then it can be designed as a separate entity. When I was designing my plan for the garden at the White House, which was to be made in an old builder's yard, I was lucky enough to have a visit from Mr. G. P. BAKER. He then told me that Irises look particularly well on the curve of a circle. This is because as one walks on the round a harmonizing colour appears in sight beyond the Iris near at hand. As one moves forward, it in turn comes into the foreground with a fresh colour beyond. In this way the colour combinations change all the time. This planning of the colours gives much interest but it requires careful thought. Try this and see how amusing it can be—two of the photographs show this experiment in practice (Figs. 80 and 81).

Sometimes, if one has a spare piece of ground between two portions of a garden, Irises, with perhaps some shrubs and herbaceous plants on each side of a wide path, make a pleasant and interesting special feature.

I have found "home-made" cement stone paving is a good way of edging Iris beds. It makes mowing easy and does not leave a hollow at the edge of the bed into which moisture, pressed out of the path by the mower, seeps into the Iris beds. It saves also the labour of trimming the grass edges, which takes much valuable time.

I shall treat the subject from a personal point of view and try to explain what I consider essentials, and detail some of the things which have helped me most in about twenty odd years of Iris growing. I hope in this way to be able to help beginners to produce individual gardens.

I am inclined to believe that the root of the question, which will govern all your future treatment of this subject, is to decide just what type of plant and flower pleases you most, what shape of flower you yourself like best and what colours you intend shall predominate in your scheme. This, I feel, is the necessary first step in making personal selection of what Irises you intend to grow.

There are four points about an Iris to be carefully considered; they are: (a) stamina, (b) shape of flower, (c) branching, (d) colour.

(a) *Good stamina* in a bearded Iris is vital to success, for unless it will grow well and flower fairly regularly it is of no use in your garden.

It should, however, be remembered that differences of soil affect Irises considerably, and that one that flourishes in your friend Mr. A.'s garden may be a failure in your own or in Mr. B.'s. If this is so, enjoy its beauty in Mr. A.'s garden but omit it from your own.

(b) *The actual shape* of a bearded Iris varies more than, as a beginner, one imagines it does. How the standards and falls are placed and their relative proportions are dominating factors in their appearance. Personally, I definitely prefer standards which are closed at the top, for, besides looking cleaner in outline, the flowers suffer much less in the wind. The falls are either flaring or drooping. I consider that flaring falls are the most attractive, for they seem to give an alive and alert effect to the whole flower. This is, again, purely a matter of taste. A photograph of Irises shows the type I would myself select. Fig. 83 is an Iris which appeared in my temporary garden when I was living at Norman Mede Hotel. I do not know its name, but, I believe it must have come tucked in amongst some of CAYEAU's roots, for I never bought it. The falls in the one on the left show the type I think good.

(c) *Branching*.—The consideration of this quality in an Iris has become of increasing importance in recent years. Wide branching starting low down the stem is now looked upon as essential in a good Iris, because it gives room for the flowers to be well spaced and to show their beauty of form. The Irises derived from the *Pallidas*, with short branches and the flowers close to the stem, lack much of the elegance of the newer crosses.

(d) *Colour*.—This is the side of my subject that I find most difficult to discuss on paper, without the actual Irises to illustrate it. We all have our own personal views on colour and, incidentally, I believe, colour names convey different colours to different people. One has to consider what colours one personally likes together—which go well next to each other and improve their neighbours, and which spoil what is placed next to them. The owner of a small garden does better generally to have one colour predominating in his or her scheme. I, myself, find that I use a good deal of blue, perhaps more than most people, but then blues do particularly well on the chalky soil of Hampshire.

We none of us agree as to the value of yellows or which yellows one wants to predominate. Personally my choice, I find, is always for what I would call a greenish, as opposed to a strong and vivid yellow. What is often successful, is to use two or more differing yellows. This was what we did with our yellow background wools in the embroidery for Winchester Cathedral; we sometimes used five or six together.

Variegatae are apt to be difficult to place successfully. I think they are perhaps best near creams and warm-toned reds. Pinks and pink blends are helped by white and very pale blues. The darker, deeper real blues are good near oranges and orange blends. From these notes it will be noticed that colours may be used for contrasts or for harmony and it is this balancing of them that adds interest to the planting.

Before leaving this subject I would like to add—do not be afraid of using magenta, as in a garden it can often be extraordinarily useful; put near to a real vivid blue it is quite beautiful. I often use the small-flowered *Gladiolus byzantinus* next to blue *Iris sibirica*, and find this combination most successful. On the wall behind and near by I have put a magenta everlasting climbing Pea, and also a clump of the tall magenta Anemone—and both look good.

I think the question is, perhaps, well summed up by a remark an old gardening friend once made to me. He said, "Some plants will not grow next to each other, because they dislike their neighbours." It was a reference to what some plants put into the soil, and what they take out of the soil. This is, I believe, true, but not in respect to soil only, but with respect to colour. It is only when you have put good-colour neighbours next to each other that you will get the best colour out of them.

When I started growing Irises a good many years ago, I knew absolutely nothing about them. The only Iris I knew by name was 'Alcazar,' raised in France by VILMORIN. I had seen it at a Royal Horticultural Society's Show, when it was first shown in England. A friend had some lovely scarlet Anemones, which she had ordered from VILMORIN and I wrote for his catalogue. He advertised unnamed Irises to colour—white, yellow, blue and purple; they were cheap and I ordered twenty-five of each colour. On leaving Weymouth I discarded those that I did not specially like. Later again, at Twyford, I bought unnamed seedlings from three English firms and again discarded any I did not want, ones that did not satisfy me either for colour or shape. After this drastic selection and elimination I began to know what I really liked, and was ready to buy a few more expensive ones on which to start my own 'breeding.'

Hybridizing.—Long ago a neighbour lent me an old book by THOMAS HALE, published in 1757, and called *Eden or the compleat body of gardening*. It was, I believe, a monthly publication and contained much about various kinds of Irises. The note on soil was interesting: "mix 1 load rich meadow soil with $\frac{1}{2}$ load pond mud, 2 bushels of sand, 3 bushels of old cow dung." This is a much stronger mixture than we give to-day, but might be helpful for use on really poor soil. His note on hybridizing interested me greatly, as I was just about to start doing it myself. "Every good gardener will naturally renew his stock by growing from his *own seeds*. In this manner, he will be able to select just those colours and size of plants that he requires for his particular use." I sometimes wonder if the fact that I grow so many seedlings makes people say when they visit my garden: "You have so many Irises we do not see in other gardens."

A few details about hybridizing might be useful to those who want to experiment with breeding themselves. *Stamina and habit* are said to come from the seed-bearing parent whilst colour is influenced by the pollen parent. This is the general theory, but when I started, after telling me this, my friends usually added "but try the cross both ways." As stamina is most important, it is good to make the cross on to a plant that is known to be strong, and if possible to choose one that flowers regularly. This is worth remembering, as one wants these qualities passed on to the progeny. Experiments are the only method of learning what to do and what not to do. Keep a careful stud book of all crosses so as to watch and trace results.

I often work out family trees of my seedlings, because by tracing the various Irises that are included in the pedigree of a seedling, it is possible to note from what sources colour, shape, branching or stamina has been derived.

The American Iris Society's Check List gives much information as to parentage; it can be seen or borrowed from the R.H.S. Library by members. A note which I once saw on hybridizing stressed the point that it was good in dry weather to water Irises that had been crossed, and whilst the seed-pod was swelling. I have never myself

done this, but am much struck this year (1945), when we have had alternate rain and sunshine, to see what large strong seed-pods are forming ; so it is evidently a fact to remember.

How soon to sow the seeds has always been a debatable question, green or dry. A recent note stresses again that the best results came from sowing the seeds three days after the ripened pod splits open.

There is an article in the *American Iris Society Journal*, No. 96, February 1945, p. 62, by EDWARD WATKINS, called " Insuring more 'Takes'." He says that whilst some Irises are bisexual, some definitely are not. It is certain some have no pollen and these will probably yield good seed-pods, whilst those with exceptionally potent pollen will give only poor-seed pods, if at all. The writer says that if these points are watched and notes made of them, a much larger percentage of better seed-pods will be the result. I have not seen this point discussed, and it certainly appears worth exploring further.

Even if you have as many Irises as I seem to manage to collect, it is necessary to have some other plants to give colour at different times of the year. It is difficult to know what will not eventually take up too much room or be too greedy on the soil. Experiments are the only thing and the casting out of plants that have grown too big. Small shrubs give you contrast in a small garden, otherwise the sides and edges are apt to look flat. Dwarf lavenders are useful and anything with grey foliage gives a lovely background for some of the blue Irises in particular. *Senecio Greyii* needs keeping under control but is useful.

The flowering Cherries are a perfectly beautiful sight in bloom, and can be used in corners or as a screen between neighbours' gardens. Other plants, which I like and often use are Lupins ; they should not be too emphatic in colour. The old-fashioned Aquilegias give better contrast than the long-spurred ones. They come in deep blues, purples and dark pinks, and are satisfactory in masses. One can use Tulips to give a little colour before the Irises are in full bloom, while *Anemone Pulsatilla* and Michaelmas Daisies fill up the free spaces later in the year. Hollyhocks and tall Phlox help to give height if space can be found for them.

Edgings.—There is finally the question of edgings to the beds ; I feel sure that stone or cement in flat blocks makes the best edges. Behind them I use rock plants—mauve Cheiranthus, Pinks, Violas and small Antirrhinums ; Rock Roses flower with the Irises, so are useful for added colour, pink in particular.

On the top of my low walls I use anything I have or am given, just to give colour amongst the more considered planting. The only other Irises that I suggest for the smaller gardens besides, of course, *I. sibirica*, are *I. stylosa*, which should be planted against the house or a wall as they do best on rather poor soil.

I hope this rather informal information will help those who have only small gardens and are still beginners in Iris cultivation, to realize some of the fundamental points necessary to the successful planting and growing of Irises.

I would only add—be advised to grow at least a few plants from your own seeds, for I can assure you it is a very much worth-while hobby. If you get as much interest out of it as I have done, you will, I know, be grateful that I have urged you to do this. I can assure you the most exciting month in the garden is when your seedlings first show their colour. One hopes that at last one has produced one really worth-while Iris.

ROSES AFTER THE WAR.

By GEORGE M. TAYLOR.

(Lecture given on June 19, 1945 ; Canon Rollo Meyer in the Chair.)

IN presenting this short study of "The Rose Garden after the War," I am well aware of the difficulties and hazards of the attempt. Questions of great complexity must be handled in a few minutes, and many important theories must be neglected, simply because the multitude of trees must not be allowed to eclipse the forest. I shall attempt to mark out a straight, if somewhat narrow, path through the forest, and one which leads to some of the viewpoints from which a wide outlook may be gained, and I hope some of my listeners may be tempted to explore more widely the possibilities I have ventured to suggest in this lecture.

To begin with, we must examine the history of the Rose and the way in which its cultivation has developed in this country : we must note certain factors which had a very powerful influence in determining the kinds of Roses that were grown in quantity ; and we must also consider the reign of supremacy of the Exhibition Rose to the detriment of the more facile and homely Decorative variety. History is of great importance in this matter : all our heritage from the past is not bad and we can learn much from the experiences of Rose growers of the past ; we can be taught much that is of value to us ; we can avoid their errors and, with modern knowledge of cultivation and of varieties, we can improve upon their methods and gain material advantage thereby.

Let us, therefore, go back for exactly one century and see what kind of Roses adorned the gardens of those days. I have chosen the year 1846, because in that year we had two Roses introduced belonging to a class that has had the most potent influence upon the fine sorts that are such a source of pleasure to-day. I refer to the Tea—the pure Tea—Roses which, in my opinion, are still the most beautiful of all our Roses, and, unfortunately, the most neglected. I may be old-fashioned, but I deeply deplore the fact that the typical Tea Rose has practically disappeared from cultivation, a loss which we simply cannot afford when we consider its history and its value for breeding purposes for the production of colour, form and fragrance. The Tea Roses were very lovely : they had a delicacy and refinement that was peculiarly their own ; they were the aristocrats of the Rose world and, despite all these virtues, they were sadly neglected.

Well, then, I have taken the year 1846 as the starting-point of my review of Roses because in that year DESFOURGERES gave us 'Souvenir d'un Ami,' and GUILLOT gave us 'Madame Bravy,' two Tea Roses that marked the beginning of a race to which we owe most of the beauty found in modern varieties. Tea Roses had, of course, been raised before then—the first was named 'Adam,' raised by a florist of that name in Rheims in 1833, and BEAUREGARD gave us 'Safrano' in 1839, which was a remarkable variety. I can only refer very briefly to the ancestry of the Tea Roses ; suffice it to say that the characters of the first of them were intermediate between the China and the original Bourbon, and the Noisette and the yellow China. It is to the

Tea Roses, through their alliance with the various Chinas, that we owe the most important improvement in our garden Roses, because the China Rose—in its various forms—has in its cells a gene which causes continuous growth, and every growth produces a flowering shoot, the result being that our modern Roses tend to blossom practically all the year round. In view of what we may expect in Rose gardens of the future, let us bear in mind the fact that we owe the perpetual-flowering character of our present-day sorts to the Tea Roses in association with their Chinese ancestors.

What was the cause of the neglect of the Tea Roses? Two prime reasons may be assigned. The first was the introduction of the so-called Hybrid Perpetual Roses, and I shall deal with the second reason later. The title accorded to the race of Roses named Perpetuals was a misnomer and was most misleading, for in no way whatever could they be called Perpetuals, or remountants, as the French termed them. The first Hybrid Perpetual was 'Rose du Roi' raised near Paris by SOUCHET in 1816. If you study the history of the evolution of the Rose you will find that 'Rose du Roi' was quite evidently bred from a China-Damask-French ancestry, for one of its parents was the famous but obscure Portland Rose which is unquestionably of China character. Nothing eclipsed 'Rose du Roi' until the larger Hybrid Perpetuals came into being in 1837. LAFFAY, the great French rosarian of Auteuil gave us 'Princess Helene' in that year, and then came 'Madame Laffay' and 'Duchess of Sutherland.' But the most important of all was his 'Rose de la Reine' which he sent out in 1842. For size, colour, and fragrance it was a vast improvement upon anything that preceded it. LAFFAY raised eighteen Hybrid Perpetuals between the years 1837 and 1843, and it is now thought that they were raised from seeds of the Hybrid Chinas, probably, in some cases, fertilized with the Bourbons and Portlands.

To begin with, then, judging from the parentage, some of the earliest forms of the Hybrid Perpetuals had some justification for their descriptive name, but, as time went on, we began to get the class that entirely dominated our gardens from 1840 until 1890, when the Hybrid Teas began to assert their superiority.

It will be noted that the advent of the Hybrid Perpetuals was almost contemporaneous with that of the Teas. The latter were pushed into the background; the former were received with favour and attained a great popularity in the Rose world. Now, there is a point here that requires to be emphasized, for it is a factor that determined the kind of Rose that was in the ascendant for half a century—1840–1890—in gardens. With the coming of such magnificent Roses—for they were really magnificent when well grown—that Calvinistic horticulturist, the florist of those days, not his mild successor of these days, took up the Rose in the same way as he and his forefathers took up Auriculas, Pinks, Tulips, Ranunculus, Pansies, Carnations, Dahlias and other, so-called, "Florists' Flowers." There could only be one result. The old florists were primarily exhibitors, and the flowers that appealed to them were of little value from the point of view of beauty either in the garden or for decorative work when cut. Those florists made their own laws, they created rigid standards for all their flowers, and if a bloom did not conform to their quaint conception of what it should be, it was ruthlessly discarded. And in that process what a lot of fine plants—Roses included—must have been destroyed without mercy. With all their exactitude and precision,

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

MAY 29, 1945.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

Methoxylon as a weed-killer.—Dr. Tincker showed the results of attempts to kill perennial weeds with the "growth-substance" methoxylon which, used at parts per thousand instead of parts per million, has a destructive effect. Reports in *Nature* of April 28, 1945 (p. 497), showed that this substance was an efficient killer of most annual weeds though slower in action than sodium chlorate. Trials made by Dr. Tincker at Wisley demonstrated, however, that the effect upon perennials was very variable and some of them were little affected. Cats-ear and Plantain succumbed if treated individually, Goutweed was somewhat resistant but was killed by solutions of 1 to 2,500. Nettles were intermediate and Docks somewhat resistant. Neither Bracken nor Brambles were killed when sprayed with 4 oz. of methoxylon to the square yard, though Rhododendrons suffered severely. Sowthistles proved resistant and so also did Liverworts such as often grow on the surface of pots. In any case the treatment would be more expensive than the use of sodium chlorate.

Pest of Coloneaster horizontalis.—Mr. G. Fox Wilson showed a specimen of the 'nest' of the caterpillars of the small moth, *Scythropia crataegella*, which has proved a frequent pest of *Coloneaster horizontalis* of recent years in Surrey and in a few other parts of England. It is difficult to keep in check unless Nicotine dust is used. This has been found effective.

Melandrium hybrid.—The Director of Wisley showed a hybrid between *Melandrium Ingramii* and *M. rotundifolium* raised in the R.H.S. Gardens. It had large flowers but the habit seemed somewhat sparse and the colour less bright than that of *M. Ingramii*.

Pentstemon ovatus.—Two plants shown under this name were referred to the Committee by Floral Committee B, that shown under the name of 'Munstead Blue' having larger leaves with taller growth and somewhat larger flowers of a rather brighter shade than the other. They were both forms of the somewhat variable *P. ovatus* and possibly showed greater differences than might be expected in the species by having been grown under different conditions.

Viburnum erubescens was shown by Mr. W. Butt, of West Porlock, Somerset. It is a peculiar species with (like *V. fragrans*) tubular flowers which (unlike *V. fragrans*) are in a long drooping panicle and unfortunately lack the sweet fragrance of their relative. *V. erubescens* is a native of Nepal and Western China.

Galls on Abies.—Lt.-Col. J. F. Batten, of Bray, Berks., sent shoots of an *Abies* with old galls upon the growths caused by the Chermes, *Adelges piceae*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRETT, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended :—

Silver-Gilt Knightian Medal.

To Messrs. Sutton & Sons, Reading, for collection of Vegetables.

Cultural Commendation.

To Mrs. M. Lyall, Home Close, Burnham, for a dish of Strawberry 'Royal Sovereign.'

Other Exhibits.

Seedling Cherry, from Chas. J. Howlett, The Yews, 309, Wokingham Road, Earley, Reading.

Strawberry 'Royal Sovereign,' from Lord Leconfield, Petworth Park, Petworth.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :

Gold Medal.

To Messrs. Baker, Wolverhampton, for an exhibit of Russell Lupines.

Silver-gilt Flora Medal.

To Messrs. Bees Ltd., Chester, for an exhibit of herbaceous plants.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of Lupines and Irises.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Irises and Lupines.

Silver-gilt Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Begonias and Delphiniums.

Silver Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations.

To Stamford Park Joint Committee (Superintendent, Mr. A. Falconer), Stalybridge, for an exhibit of Hydrangeas.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of Lupines, Irises, Pæonies, etc.

Silver Banksian Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Pæonies, Irises, etc.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations & Pansies.

To Messrs. Hewitt & Co., Stratford-on-Avon, for an exhibit of Lupines, etc.

To John Innes Horticultural Institution, Merton, for an exhibit of Streptocarpus.

To Mr. E. Ladhams, Elstead, for an exhibit of herbaceous plants and alpine.

To Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Irises.

To Stamford Park Joint Committee (Superintendent, Mr. A. Falconer) Stalybridge, for an exhibit of *Calceolaria Banksii* var. 'Stamford Park.'

To Mr. G. G. Whitelegg, Chislehurst, for an exhibit of Irises.

Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of *Dianthus Allwoodii*.

To Rev. Canon Rollo Meyer, Little Gaddesden, for an exhibit of Irises.

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of Irises.

Banksian Medal.

To Messrs. Biddlecombe Bros., Bracknell, for an exhibit of Carnations.

To Mr. M. P. Kooper, Ferndown, for an exhibit of herbaceous plants and alpine.

To Mrs. D. R. Moore, Farnborough, Kent, for an exhibit of Pelargoniums.

To Messrs. Wakeley Bros. & Co., Ltd., London, for an exhibit of Irises and Delphiniums.

Cultural Commendation.

To Mr. A. Falconer, Superintendent, Stamford Park Joint Committee, Stalybridge, for an exhibit of *Calceolaria Banksii* var. 'Stamford Park.'

Selected for trial at Wisley.

Lupine 'Beryl Viscountess Cowdray,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Betty Astell,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Canary Bird,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Cynthia Knight,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Dainty Maid,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Eva Reading,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Fireglow,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Heather Glow,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Simon Henry,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Thundercloud,' from Messrs. Baker, Ltd., Wolverhampton.

Lupine 'Commando,' from Messrs. Astolat Co., Ltd., Guildford.

Schizanthus wisetonensis 'Stamford Park' var., from Stamford Park Joint Committee, Stalybridge.

Streptocarpus 'Merton Blue,' from The Director, John Innes Horticultural Institution, Merton.

Other Exhibits.

Anagallis × 'Avalon,' from Orchard Neville Nurseries Ltd., Baltonsborough.
Iceland Poppies, from Messrs. Clarence Elliott, Ltd., Stevenage.
Nepeta erecta and *N. Rotundifolia*, from Messrs. Stark & Son, Ltd., Fakenham.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty-four other members present.

Awards Recommended:—*Silver-gilt Flora Medal.*

To Messrs. W. A. Constable, Ltd., Southborough, Kent, for an exhibit of Lilies and other hardy flowers.

To Major E. de Rothschild, Exbury, Southampton, for an exhibit of Rhododendrons.

To Messrs. L. R. Russell, Ltd., Windlesham, Surrey, for an exhibit of ornamental-foliaged shrubs, Pæonies, etc.

Silver-gilt Banksian Medal.

To Messrs. D. Stewart & Sons, Ltd., Ferndown, Dorset, for an exhibit of Rhododendrons and other flowering shrubs.

Silver Lindley Medal.

To Messrs. Baker, Wolverhampton, for an exhibit of varieties of *Rhodohypoxis Baurii*.

To the Duke of Richmond and Gordon, Goodwood, Sussex, for an exhibit of *Richardia Pentlandii*.

Silver Flora Medal.

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering shrubs.

To Messrs. Orchard Neville Nurseries, Baltonsborough, Somerset, for an exhibit of rock garden plants.

Silver Banksian Medal.

To Mr. K. W. Harle, Lower Basildon, Berks, for an exhibit of succulents.

Flora Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering shrubs.

To Mr. J. Robinson, Eltham, S.E. 8, for an exhibit of rock garden plants.

Banksian Medal.

To Messrs. Edrom Nurseries, Coldingham, Berwickshire, for an exhibit of hardy Primulas.

Award of Merit.

To *Campanula laciniata* as a hardy flowering plant for the rock garden and alpine house (votes unanimous), from Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, Sussex. See p. 275.

To *Lilium* 'Burnham Orange' as a hardy flowering plant (votes unanimous), from Messrs. W. A. Constable, Ltd., Burnham, Bucks. See p. 275.

To *Rhodohypoxis Baurii* 'Major' as a hardy flowering plant for the rock garden and alpine house (votes unanimous), from Mrs. Garnett-Botfield, Beamish, Albrighton, Wolverhampton. See p. 276.

To *Styrax japonicus* var. *Fargesii* as a hardy flowering tree (votes 14 for, 0 against), (subject to verification of name), from Capt. Collingwood Ingram, Benenden, Kent.

To *Typha minima* as a hardy aquatic plant (votes unanimous), from Mr. Amos Perry, Enfield. See p. 276.

Preliminary Commendation.

To *Dimorphothea Barberiae* as a hardy flowering plant for the rock garden (votes unanimous), from Mrs. Vera Higgins, M.A., Croydon.

To *Melandrium Ingramii* × *rotundifolium* as a hardy flowering plant for the alpine house and scree (votes unanimous), from the Director, R.H.S. Gardens, Wisley.

Other Exhibits.

Campanula petrophila, exhibited by Mrs. F. L. Caspersz, Ockley.

Chionanthus retusus, Forrest's Variety, exhibited by Col. F. C. Stern, O.B.E., M.C., Goring-by-Sea.

Clematis 'La France,' exhibited by E. E. Roper, Esq., Hildenborough, Kent.

Collection of hardy ferns, exhibited by C. J. Howlett, Esq., Reading.

Ochna multiflora, exhibited by Stamford Park Committee, Stalybridge.

Pentstemon ovatus, exhibited by Mr. G. G. Whitelegg, Chislehurst.

xliv PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Penstemon ovatus 'Munstead Blue,' exhibited by F. W. Jekyll, Esq., Godalming.

Viburnum crubescens, exhibited by W. Butt, Esq., West Porlock, Somerset.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. Stuart Low & Co., Jarvis Brook, Sussex, for a group of Orchids.

Silver-gilt Banksian Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

No awards were made to separate plants.

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and nine other members present.

Award Recommended :—

Award of Merit.

To 'Blue Lagoon,' as an exhibition variety, votes 6 for, 0 against, shown by Mr. F. A. Bishop, The Glade, Clewer Green, Windsor. See p. 275.

JOINT IRIS COMMITTEE.—Colonel F. C. STERN, O.B.E., in the Chair, and thirteen other members present.

Selected for trial at Wisley.

'Bulwark,' 'Anthony' and 'Seedling 315,' shown by H. J. Randall, Esq., Sandilands, Woking.

'Rhapsody' and 'Seedling G.30,' shown by The Orpington Nursery Co., Ltd., Orpington, Kent.

Other Exhibits.

Seedlings 25/40, 50/39, No. 328, No. 313, No. 308, shown by H. J. Randall, Esq., Woking.

'Morar,' 'Christina Ind.,' 'Gay Dowager,' shown by Lady Isabel Browne, Mount Browne, Guildford, Surrey.

'Copper Lustre,' 'Rose Violet' (now at Wisley), 'Evolution Cross,' 'Waterfall' and Seedling E.2 B, shown by The Orpington Nursery Co., Ltd., Orpington, Kent.

The award to the Iris under trial at Wisley was confirmed.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron* 'Albatross,' Townhill form (*R. Loderi* 'King George' × *discolor*) (votes 6 for, 2 against), from the Rt. Hon. Lord Swaythling, Townhill Park, Southampton. See p. 276.

To *Rhododendron* 'Mosaïque' (*R. ambiguum* × *R. Cinn-keys*) (votes 10 for, 0 against), from Major E. de Rothschild, Exbury, Southampton. See p. 276.

To *Rhododendron* 'Mohamet' (*R. dichroanthum* × *R. 'Tally-ho'*) (votes 7 for, 0 against), from Major E. de Rothschild. See p. 276.

To *Rhododendron* 'Grosclaude' (*R. haematodes* × *origynum*) (votes 10 for, 0 against), from Major E. de Rothschild. See p. 276.

To *Rhododendron cinnabarinum* var. *Blandfordiflorum* (votes 6 for, 1 against), from Lord Aberconway, Bodnant, N. Wales. See p. 276.

Other Exhibits.

Rhododendron 'Fabia' × *discolor*; *Rhododendron Soulei* × *R. 'Fabia'*; *Rhododendron* 'Britannia' × *Griersonianum*; *Rhododendron* 'Fabia' × *scyphocalyx*; *Rhododendron* 'Ladybird' × *Griersonianum*; *Rhododendron* 'Erebus' × *Griersonianum*; *Rhododendron* 'Griersons'; *Rhododendron cerasinum*, from the Rt. Hon. Lord Swaythling.



FIG 79—A FINE IRIS GARDEN
, See p 257



Photo Mrs Lukin.

FIG. 80 - IN THE AUTHOR'S IRIS GARDEN, IRIS 'NAIAL' ON THE RIGHT

(See p. 257.)



Photo, Mrs. Lukin.

FIG. 81. IN THE AUTHOR'S IRIS GARDEN
(See p. 257.)



FIG. 82 THE AUTHOR'S IRIS GARDEN
(See p. 257)



FIG. 83 -- IRIS SEEDLING SHOWING GOOD TYPE OF FLOWER
(See p. 258.)



FIG. 84 -- COLONIES OF WOOLLY APHIS, *Eriosoma lanigerum* HAUSD., OVER-
WINTERING ON WALL-SHELTERED BRANCHES OF *Cotoneaster horizontalis*.
(See p. 271)



FIG. 85. UNDERSIDE OF BRANCHES OF *Cotoneaster horizontalis* THICKLY INFESTED WITH THE BROWN OR PEACH SCALE, *Lecanium cornu* Bouché
(See p. 273.)



FIG. 86 —WEB-SPINNING CATERPILLARS OF A TINEID MOTII, *Scythropia
crataegella* L , ON *Cotoneaster horizontalis*
(See p 275)

Rhododendron 'Hawk' var. 'Jervis Bay' (*R. Wardii* × 'Lady Bessborough'); *Rhododendron* 'Hermes' (*R. apodectum* × *Loderi*); *Rhododendron* 'Minerva' ('Sir Frederick Moore' × *Elliotii*); *Rhododendron* 'Marie Antoinette' (*R. Albatross* × 'Ariel') from Major E. de Rothschild, *Rhododendron* 'Vanity Fair' (*R. 'Vanessa'* × *eriogynum*); *Rhododendron crassum* (Farrer's form), No. F. 1044, from Lord Aberconway. *Rhododendron bullatum* 8206; *Rhododendron* 'Nanceglos' (*R. Fortunei* × *Elliotii*); *Rhododendron* 'Penhale' (*R. Fortunei* × *eriogynum*), from Col. E. H. Bolitho, Trengwainton, Penzance, Cornwall.

JUNE 19, 1945.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

Rharya orientalis.—The Committee confirmed the identification of this shrub from Mr. Rothschild's garden at Exbury. The material upon which Dr. Stapf based his description in the *Botanical Magazine* (9119) of 1926 was obtained from the same garden.

Iris.—Miss Pesel of Winchester sent a flower of a pale yellow *Iris* of which the segments were mottled with small light blue spots. The foliage was reputed to resemble that of *Iris sibirica*. It was suggested that this hybrid *Iris* was possibly raised from the parentage *sibirica* × *Wilsonii*, as the flower possessed characteristics of each. Examination has revealed that the *Iris* is not a typical example of *Wilsonii*, but perhaps nearer this than *Bulleyana*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. A. CHEAL in the Chair, and nine other members present.

Recommended for trial at Wisley.

Melon 'Read's Mid-Winter,' from Mr. J. W. Read, Kamarunga, Hockley, Essex.

Other Exhibits.

Fig (variety unknown), from W. Whitaker, Esq., Pylewell Park, Lymington, Hants.

Melon 'December Gold,' from Mr. J. W. Read, Kamarunga, Hockley, Essex.

Strawberries 'Early Cambridge' and 'Oberschlesien,' from Mr. C. J. Gleed, 78 St. Cross Road, Winchester.

Strawberry 'Redbourn,' from Mr. G. S. Dunn, The Hame, Redbourn, Herts.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seven other members present.

Awards Recommended:—*Gold Medal.*

To Messrs. A. G. Linfield, Ltd., Thakeham, for an exhibit of Sweet Peas.

Silver-gilt Flora Medal.

To Messrs. Baker, Ltd., Wolverhampton, for an exhibit of Russell Lupines.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Delphiniums.

Silver Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Border Carnations.

Silver Banksian Medal.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants.

Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of *Dianthus Allwoodii* and Garden Pinks.

To Dr. D. M. Amsler, Hawkhurst, for an exhibit of Pinks, Lilies, etc.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

To Mr. E. Ladhams, Elstead, for an exhibit of alpine and herbaceous plants.

Banksian Medal.

To Mrs. D. R. Moore, Farnborough, Kent, for an exhibit of Pelargoniums.

Other Exhibits.

Garden Pink 'Delmonden Fairy,' from Dr. D. M. Amsler, Hawkhurst.

Roses from Messrs. Wheatcroft Bros., Ltd., Nottingham.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and twenty other members present.

Awards Recommended :

Silver-gilt Banksian Medal.

To Messrs. W. A. Constable, Ltd., Southborough, Kent, for an exhibit of Lilies and Alstroemerias.

Silver Flora Medal.

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering shrubs.

To the Rt. Hon. Lord Swaythling, Southampton, for an exhibit of Lilies.

Silver Banksian Medal.

To Mr. K. W. Harle, Lower Basildon, Berks., for an exhibit of succulents.

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of flowering shrubs.

Flora Medal.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering shrubs.

To Messrs. Orchard Neville Nurseries, Baltonsborough, Somerset, for an exhibit of rock garden plants.

Award of Merit.

To *Lilium* 'Phyllis Cox' as a hardy, herbaceous flowering plant (votes unanimous), from Walter Bentley, Esq., Quarry Wood, Newbury.

To *Rhazya orientalis* as a hardy, herbaceous flowering plant (votes 13 for, 2 against), from C. H. Curtis, Esq., Brentlea, Brentford, and Major E. de Rothschild, Exbury, Southampton.

To *Rosa filipes* var. *semi-plena* as a hardy, flowering shrub (votes 11 for, 4 against), from Dr. M. Amsler, Hawkhurst, Kent.

Other Exhibits.

Carrierea calycina, exhibited by Col. S. R. Clarke, C.B., Haywards Heath.

Clematis uncinata f. *retusa*, exhibited by Col. F. C. Stern, O.B.E., M.C., Goring-by-Sea.

Gentiana lutea, exhibited by Sir G. H. Shackerley, Uckfield.

Lilium Davidii var. *immaculatum*, L. 'Corsair,' exhibited by Messrs. W. A. Constable, Ltd., Southborough.

Lonicera americana, exhibited by the Director, Royal Botanic Gardens, Kew.

Pyracantha Rogerstiana, *Solanum crispum* Glasnevin Variety, exhibited by Col. the Lord Digby, Dorchester.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and six other members present.

There were no exhibits before the Committee on this occasion.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and six other members present.

Exhibits.

'Sussex Cerise' and seedling B152/J, shown by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex.

'Phyllis Mary Single,' shown by G. Rumley, Esq., Talbot Road, Dagenham, Essex.

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and six other members present.

Awards Recommended :

Award of Merit.

To 'Blackmore's Blue,' 'Minerva,' 'Princess Alexandra' and 'Pyramus,' as exhibition varieties (votes 6 for, 0 against in each case), shown by Messrs. Blackmore and Langdon, Bath.

Selected for trial at Wisley.

'Blackmore's Blue,' 'Bathonian,' 'Chas. F. Langdon,' 'Glorious,' 'Julia Langdon,' 'Michael Blackmore,' 'Minerva,' 'Lady Mount Temple,' 'Princess Alexandra,' 'Pyramus,' 'Sarah Siddons,' 'Sylvia Blackmore,' 'Twertonian,' shown by Messrs. Blackmore & Langdon, Bath.

'Seedling No. 100,' shown by H. A. Perkin, Esq., Lane House, Bognor Regis.

Other Exhibits.

'Azurea,' 'Jennifer,' 'Startling,' 'Mayor of Bath,' 'Kingfisher' and 'Lady Wightman,' shown by Messrs. Blackmore & Langdon, Bath.
 'Sylvia,' shown by Mrs. E. H. B. Skimming, Taplow House, Taplow, Bucks.
 'Mary Sackett,' 'Mary Brinkworth,' shown by J. S. Brinkworth, Esq., Birch View, Joydenswood Road, Bexley, Kent.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON, V.M.H., in the Chair, and six other members present.

Awards Recommended:—*Award of Merit.*

To *Rhododendron* 'Impy' (*R. didymum* × *R.* 'Moser's Maroon') (votes 6 for, 1 against), from Major E. de Rothschild, Exbury, Southampton.

To *Rhododendron* 'Red Cap' var. 'Townhill Park' (*R. didymum* × *R. eriogynum*) (votes 6 for, 1 against), from the Rt. Hon. Lord Swaythling, Townhill Park, Southampton.

Other Exhibits.

Rhododendron amagianum, from Lord Aberconway, Bodnant, N. Wales.

Rhododendron Elliottii (?) hybrid, from Captain Murray Adams-Acton, 37 Palace Gate, Kensington, W. 8.

JULY 3, 1945.**BANKSIAN MEDAL FOR BEST NEW HYBRID LILY.**

The Banksian Medal offered for award for the best new hybrid lily shown by an amateur was awarded to W. Bentley, Esq., Newbury, for *Lilium* 'Coronation.'

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Primula japonica.—An abnormal plant was sent by Mr. D. E. Green, Mycologist, who had received it for examination from L. Mason, Esq., Talbot Manor, King's Lynn. It arose in a batch of seedlings, and whilst carrying foliage closely resembling that of *Primula japonica* the flowers were abnormal and foliaceous. The inflorescence was more strict in its branching, the sepals expanded at the tips somewhat and foliar, the petals reduced in size and green, fading to a dark brown. The ovary was fertile, containing many seeds. The pistil in some of the flowers had a capitate foliar stigma of many involutions. The plant bore characters reminiscent of the freak Plymouth Strawberry.

Chrysanthemum maximum.—Several fasciated inflorescence stalks were sent from Messrs. Cooper, Jescot Nurseries, St. Albans. The flattened stems measured 3½ inches across and one bore twelve small inflorescences of which several were subdivided by small individual stems. A further number of small subsidiary flower heads had begun to develop below the terminal ones.

Pest of Malvaceae.—Mr. Robinson showed *Malva sylvestris* heavily infested with a beetle subsequently identified by Mr. G. Fox Wilson, Entomologist, as a Chrysomelid, *Podagrica fuscicornis*, which may be controlled by application of insecticidal washes containing arsenates, or nicotine. Mr. Robinson commented upon the great range of hosts in the family Malvaceae and upon the unusual severity of attack this year, all plants of the Family in the beds in the Oxford Botanic Garden being attacked, *Kitaibelia* being apparently the most resistant.

Potentilla.—Mr. Bowles showed a *Potentilla* from W. Bentley, Esq., which Mr. Jackson took for identification by comparison with type and standard specimens.

Carrots: Aphis attack.—Mr. Jackson showed carrots suffering from an aphid attack and comments were made upon methods of control of this pest.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRET, V.M.H., in the Chair, and eleven other members present.

Recommended for trial at Wisley.

Seedling Cherry, from H. F. Stephens, Esq., The Abbey Farm, Minster, Ramsgate.

Seedling Strawberry, from A. J. Mellows, Esq., Margery House, Kingswood, Surrey.

Other Exhibits.

Collection of Cherries, from The Director, East Malling Research Station, East Malling, Kent.

Red Currant 'Red Lake,' from The National Fruit Trials, Wisley.

Seedling Raspberry, from Mrs. R. R. Foxlee, Stylehurst, Weare Road, Capel, Surrey.

Seedling Black Currant, from The Director, East Malling Research Station, Kent.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To the Rt. Hon. Lord Leconfield (gr. Mr. F. Streeter), Petworth, for an exhibit of Sweet Peas.

Silver-gilt Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Border Carnations and Garden Pinks.

Silver Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Delphiniums and Phloxes.

To Messrs. R. Bolton & Son, Birdbrook, for an exhibit of Sweet Peas.

Silver Banksian Medal.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants.

To W. G. Ferris, Esq., East Horsley, for an exhibit of Border Carnations.

To Mr. E. Ladhams, Elstead, for an exhibit of alpinas and herbaceous plants.

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of herbaceous plants.

Silver Lindley Medal.

To Mr. Amos Perry, Enfield, for an exhibit of Hemerocallis.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Sellindge, for an exhibit of Roses.

To Messrs. A. A. Buckwell & Sons, St. Mary Cray, for an exhibit of Rose 'Alamein.'

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

To Capt. B. H. B. Symons-Jeune, Old Windsor, for an exhibit of Phloxes.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of herbaceous plants.

Award of Merit.

To Begonia 'Ballet Girl' as a greenhouse flowering plant (votes 7 for, 0 against), from Messrs. Blackmore & Langdon, Bath.

To Begonia 'Salmonea' as a greenhouse flowering plant (votes 7 for, 0 against), from Messrs. Blackmore & Langdon, Bath.

To Begonia 'Scarlet Flambeau' as a greenhouse flowering plant (votes 7 for, 0 against), from Messrs. Blackmore & Langdon, Bath.

Selected for trial at Wisley.

Eremurus 'Sir Arthur Hazlerigg' and 'Tony Artindale,' from Messrs. Wm. Artindale, Ltd., Sheffield.

Other Exhibits.

Begonia 'Bouquet Rose,' from Mrs. E. Pyke, Windlesham.

Dahlia 'Beatrice Kennett,' from Mrs. E. J. Kennett, West Croydon.

Gladioli 'Blue Boy,' 'Crimson Underwing,' 'Early Bird' and 'P.T.C. Seedling,' from Mrs. H. W. Hall, Lymington.

Herbaceous plants from Mr. M. P. Kooper, Ferndown.

Pelargoniums from Mrs. D. R. Moore, Farnborough, Kent.

Poppy 'York,' from J. Raine, Esq., Fawkham.

Roses from Messrs. Wheatcroft Bros., Ltd., Nottingham.

however, we must never forget that we owe a great deal to the old florists.

Their ideals so far as Roses are concerned can be expressed by one illustration. It is the Hybrid Perpetual Rose 'Horace Vernet.' It was sent out by GUILLOT in 1866, and for many years—actually for nearly half a century—it invariably took pride of place as the best Rose in the show. So it was, undoubtedly, but consider the difficulty experienced in producing only one such splendid and shapely flower. You had to grow dozens of bushes to make sure of one perfect flower. Hundreds upon hundreds of enthusiastic amateur Rose growers went home from the shows with the name of 'Horace Vernet' in their notebooks, determined to buy plants and to grow them. What a disappointment they got! There were other great names in the Hybrid Perpetual class, and we remember such famous sorts as 'Jules Margottin,' 'Mrs. John Laing,' 'Paul Neyron,' 'A. K. Williams,' 'Alfred Colomb,' 'Charles Lefebvre,' 'Ulrich Brunner' and many others. An analysis of the Hybrid Perpetual section shows that we can divide it up into several well-defined and absolutely distinct types. For instance, we have the Jacqueminot type, of which 'A. K. Williams' is an example, the 'Rose de la Reine' type, exemplified by 'Mrs. John Laing,' and many others which need not be detailed here. But there is one exception, and that is the 'Victor Verdier' type. That Rose was sent out by LACHARME in 1860 and it has left its imprint on many of the best of the Hybrid Perpetuals and has strongly influenced the floriferous character of many of the Hybrid Teas. In the Hybrid Perpetual section such Roses as 'Mrs. R. G. Sharman Crawford' and 'Susanne Marie Rodocanachi' are obviously of its outstanding character. So far as the Hybrid Teas are concerned, we can see the potent influence of 'Victor Verdier' in such fine old Roses as 'Lady Mary Fitzwilliam' (BENNETT, 1882), and 'Madame Caroline Testout' (PERNET DUCHER, 1891). Both of these Roses were great parents and gave a host of delightful children. 'Victor Verdier' through its Tea blood has to be thanked for its beneficent influence on the floral character of many of our best Roses owing to its descent from Bourbon-Tea ancestry.

We have seen the arrival, then, of the Tea Roses and the Hybrid Perpetuals; both classes are now obsolete or nearly so. What we have to do now is to examine the cause of the immense popularity gained by the Hybrid Perpetuals at the expense of the Teas, and I mean to show that that idolatry was the cause of much disappointment to amateur growers of the not so distant past. It was written by Saint Matthew: "For there shall arise . . . false prophets, and shall shew great signs and wonders; insomuch that, if it were possible, they shall deceive the very elect." They came, those false prophets, and the most influential and persuasive of them were certain celebrated ecclesiastical brethren who dominated Rose growing for many years. The first of them was the venerable and greatly loved Dean HOLE who, through his *Book about Roses*, did much to encourage people to grow them. No one has a greater admiration for the wise old Dean than I have, but how I do regret his apostasy from his first love—beautiful *Garden* Roses or, as he called them, Roses that are beautiful upon the tree. He preached his gospel eloquently and he wrote enchantingly about Roses, but he became absolutely and totally obsessed with Exhibition Roses. He had, in a word, donned the mantle of the old florists. He was followed by FOSTER-MELLIAR, who trod worthily in his master's footsteps. He

was even more fastidious in his exaltation of the Exhibition Rose than was Dean HOLE. Did he not write in his book, *The Book of the Rose*: "Moreover, though some enthusiasts may think it is heretical, I do not consider the Rose pre-eminent as a decorative plant; several simpler flowers, much less beautiful in themselves, have, to my mind, greater value for general effect in the garden, and even the cut blooms are, I imagine, more difficult to arrange in water, for artistic decoration, than lighter, simpler and less noble flowers." Despite the note of equivocation embodied in that example from FOSTER-MELLIAR, the whole thing is a piece of horticultural casuistry that it would be difficult to eclipse when we consider the particular flower that he was dealing with. The same reverend gentleman, too, thought very little of the Hybrid Teas, but we must remember that he was writing too early to grasp the value of that great section and the enormous popularity it was to enjoy. The peculiar tribe of rosarians represented by such opinions as I have quoted, were answered to some purpose by WILLIAM ROBINSON in his book, *The English Flower Garden*, and any doubting soul about the value of Roses, either for a show in the garden or for decorative work when cut, should make a point of reading the chapter headed 'The New Rose Garden' on page 179 of that book (twelfth edition.)

The coming of the Hybrid Teas, however, soon caused a wider interest in Roses, and from 1890 until 1940 huge numbers of new varieties put in an appearance every year. In the best of them—and by that I mean those that are beautiful in the garden—the predominating influence in their make-up and character is that of the Tea. In 1905 a change took place in the Hybrid Tea section, and their original characters were altered entirely owing to their hybridization with the Pernet Roses. Some people think that this development has been all to the good; I think otherwise. The influence of the Pernet Roses is now so dominant that many of our new alleged Hybrid Teas have entirely lost their original character and the trace—or should I say the taint—of *Rosa lutea* is very evident.

The Pernet Roses were a great source of trouble to professional and amateur growers alike. I need not deal with their iniquities here—they are well known—but, after all, it was from that source that we obtained new and gorgeous colours and combinations of colours, and their advent was but another milestone in the evolution of our Garden Roses.

Then, in 1924, POULSEN gave us the first of the Poulsen Roses, that wonderful race of hybrids from the Poly-Pompons and the Hybrid Teas. This class is destined to play a great part in our gardens in future, and I suppose sorts such as 'Karen Poulsen' and some of the later ones would have driven men of the FOSTER-MELLIAR type crazy.

We have dealt with the more important types of Roses, past and present, with the exception of the Climbers and Ramblers, that have been grown in gardens; we have seen how some have disappeared, and how some have become very popular. We have seen, too, that the craze for Exhibition Roses did a lot of damage to Rose growing in general. The method of awarding Gold Medals to new Roses, too, was bad; but I am glad to say that the old way has now been superseded by Trials, and that is a worthy substitute for the prescribed way of staging cut blooms accompanied by a maiden plant on a bench in the show. The future portends a wider and more enlightened dispensation, but, before passing on to it and its possibilities, I want to

say another word about a factor which I think had a lot to do with discouraging people from growing Roses—I refer to Standards. The Standard Rose has been the cause of more deaths among Roses than anything else. I am using strong words when I say that it is a vile system of growing Roses—the mortality amongst Roses that are so grown, both in the nursery and in the garden would appear to justify what I say—and, fortunately, there are other methods capable of giving an equally beautiful display without any of the serious troubles addicted to Standards.

Then, there is the vexed question of stocks. I have had my share in that controversy in the past, and I propose to say very little about them here—it is too wide a subject and would require a paper to itself—except that I hope to see Roses grown on their own roots instead of on stocks of any kind. I have had a long life amongst Roses, and thinking over my own experiences and those of others who can think and work for themselves, I have come to the conclusion that most of the Roses we grow to-day would be happier and healthier on their own roots. I think we no longer require to grow our Roses on crutches.

That confession of faith brings me back, for a moment, to the Tea Roses. I said earlier in this paper that there were two reasons for the neglect of the Teas; I gave one of them and I now deal with the other. When that great race of Roses was being taken in hand by our Trade growers it was their practice to bud the sorts on Manetti stocks. The result was calamitous. The Tea Rose is allergic to that stock and resented it definitely and markedly. And I am not so sure that it is not equally resentful of the varied tribe of Canina stocks that are now in general use for the purpose of budding. What is the remedy? A very simple one, I think, and that is to propagate all the Tea Roses and all our favourite Garden Roses—and by that I mean all the Roses that are intended for the adornment of the garden and the home—by means of cuttings. The tribe of Thomas Didymus, of course, has a wide representation in the Rose world, as it has elsewhere, but all I have to say to doubters is—try it for yourselves. Your nurseryman will do his best to discourage you—own root Roses do not appeal to him for very obvious reasons of expediency—but, as I say, try it for yourselves—it is easily done. I am aware, of course, that my advice on this point will be treated as the mad dream of a man with “a bee in his bonnet,” and that will be especially so in the case of many people who are so bound by convention to the accepted ritual of budding that they are incapable of thinking for themselves. EMERSON was right when he wrote: “The virtue in most request is conformity. Self-reliance is its aversion. It loves not realities and creators, but names and customs.” Consider for a moment what Roses mean to you if they are on their own roots. Every sucker, every shoot from the base—and strong, vigorous suckers and shoots in abundance will be your portion if your Roses are properly grown—will yield their due of beautiful flowers. You have no extraneous suckers such a Rugosa and Canina to worry about, nothing, in fact, to the detriment of your bushes. Roses, the most of them at any rate, are all good on their own roots and make splendid growths that are invariably healthy and robust. The Tea Roses, reputed in the past to be tender and very difficult, are a case in point. I have seen them in their misery, budded upon stocks, and I have seen them in their glory on their own roots. In some old gardens where the Tea Roses are still treasured, I have seen some great plants that have been established

for years upon their own roots, and they go on, season after season, throwing up noble suckers and making strong growths. In my lifetime I have had the privilege of visiting two gardens where Tea Roses were grown in large numbers, and where money was no object so far as their cultivation was concerned. Both gardens belonged to wealthy men who loved Tea Roses. The first was the famous terrace garden near Bath, belonging to the late Mr. A. H. GRAY, and the second was at North Berwick at the summer residence of the late Mr. PETER COATS. Despite the money that was lavished upon their cultivation, they never grew like the Tea Roses I subsequently saw that were grown on their own roots in other gardens; in the gardens of those enthusiastic gentlemen the Roses were budded on various stock, and Mr. COATS even tried *R. spinosissima* for the purpose. I hunted the continent of Europe for Mr. COATS in order to obtain many of the old and almost extinct Tea Roses for him, and I obtained a good many, including the old 'Madame de Tartas,' the maternal parent of the immortal 'Madame Caroline Testout.'

There is nothing insuperable about rooting cuttings of Roses, and it is an operation that is not difficult. The nurseryman may look askance at any such suggestion and will doubtless consider it to be impracticable; but many of them, especially those who had a real understanding of their profession, made a practice of rooting cuttings of selected plants of Canina for the purpose of creating stocks for budding—a very wise thing to do when we consider the irregularity of seedlings from that source.

I now come to picture what I believe will be one of the features of the Rose Garden of the future. The whole outlook has changed and Roses will be grown more largely than ever for the simple reason that no other plant or shrub can rival them for such a gorgeous floral display over so long a period of the gardening year. And, moreover, consider the variety from which you can make such a selection: You have roses for beds; Roses adapted for the border in association with other plants; Roses for the shrubbery; Roses for pergolas, pillars and posts; Roses for walls. And, in addition to the various hybrids that are available, if you add a selection of some of the lovely species, many of them very beautiful in autumn with heavy crops of their gorgeously coloured fruits, what a display of blossom can be had and maintained.

There is certain to be a lot of work done very shortly in the breeding of new Roses, and I am sure we can expect some wonderful fresh breaks and a great advance in the improvement of our Decorative kinds. A great many of the species have not yet been handled by the breeder and from that source alone we may expect interesting results. To quote but one example as to intercrossing: I heard quite recently from America that a rosarian in that country, who is interested in the creation of new Roses for the post-war world, has a new race well on the way to satisfactory development. He started with *R. Wichuraiana* as a parent, and his object was to build up a race of very hardy hybrids, which he proposes to call Wichuraiana Hybrid Teas. He has been working on this particular line for the past thirty years, and the first of his hybrids were all of a climbing character, a result that could be expected. But he carried on, and is convinced that after a few more generations from selected seedlings it will be possible to have varieties of extreme hardiness, with all the desirable characteristics of the best Hybrid Teas. He is doing the work on a large scale. For example, last December two quarts of Rose seeds were sown, all from hand-

pollinated flowers, the objective being a red *Wichuraiana* Hybrid Tea. A similar quantity was sown the year previous, and from this lot there exist eight rows of seedlings across a five-acre field. From these many thousands of seedlings he thinks that many may be worthy of retention. It is work, in the light of our modern knowledge of plant genetics, of a somewhat hazardous and cumbersome character, but, nevertheless, it is an effort in the right direction. I have seen a photograph of one of his new *Wichuraiana* Hybrid Tea Roses. It is named 'Shades of Autumn,' and, on paper at any rate, it appears to be a very charming flower.

There are two methods of pruning open to the Rose fancier of the future, and it is entirely a matter of personal taste as to which one will be adopted, although there is no reason why both should not be carried out in the garden if the necessary space is available. The first is the usual one generally carried out in gardens. That is the conventional method of pruning the bushes in spring, and often, very often, pruning hard. Roses so grown give many people a great deal of pleasure, and if they are satisfied no more need be said. The second method is to modify the pruning and grow the Roses as tall bushes. In that event they are literally flowering shrubs of the first rank. Any of the good Hybrid Teas, such as 'Madame Butterfly,' 'Golden Emblem,' 'Elizabeth of York,' 'Betty Uprichard,' 'Mrs. Sam McGredy,' 'Madame Caroline Testout,' 'Shot Silk,' etc., and Poulsen Roses such as 'Karen' and 'Kirsten Poulsen,' 'Salmon Spray' and others of that ilk will make big floriferous bushes bearing their blossom over a very long period. The grand old Tea Roses—on their own roots, remember—like 'Georges Nabonnand,' 'Madame Bravy,' 'Madame Hoste,' 'Marie van Houtte,' 'Homère,' 'Anna Olivier,' to mention only a few, will grow well and give abundantly of their peerless flowers.

Pillar Roses, and there are many suitable for such work, would take the place of Standards and are even more beautiful and impressive and give far less trouble and worry. Climbing Roses when properly pruned are capable of giving a brilliant show and their potentialities are not developed and explored as their merits deserve. The Ramblers, I refer to the *Wichuraiana* Hybrids, may possibly decline in favour owing to the annual necessity for the drastic removal of the old flowering wood, which is very necessary if best results are to be got, but on pergolas and pillars they are splendid and well worthy of the requisite trimming every autumn. We are on the eve, too, of a new race of almost perpetual-flowering Ramblers, and that will help to popularize this fine race anew.

Let us take the Poulsen Roses as an example so far as pruning operations are concerned, and I have chosen them because I think they will be very largely grown in future. They make bold masses of striking colour, and if properly treated will reach a height of from five to eight feet with enormous trusses of brilliant blooms. Then, again, they can be kept down to a more moderate height to suit their environment if they are to be associated with other Roses such as the Hybrid Teas. In addition to their striking beauty in the garden this group of Roses is one of the best for indoor decorations: the flowers are easily cut, just as easily arranged, and will retain their pristine beauty for an extraordinary length of time. They may be said to resent hard pruning and are not successful when they are so treated. Medium pruning gives better results. Light pruning will result in earlier flowers; fairly hard pruning means autumn flowers, and medium

pruning will produce a neat, even growth. But, on the whole, the best way is to leave no wood over two years old in the bush. You are then left with two types of growth—the current year's growth and that of the previous year—and consequently you have these two to deal with. Let us assume that you buy plants from the nursery this autumn. It will be covered with growths that have been made this year, and these should be pruned in spring. Medium pruning is best, and any weak shoots should be removed entirely. During next year the shoots which are left ought to develop two or more new growths on each, and you are sure to have some strong basal shoots. In the spring of 1947 you will have two types of growth to deal with. To begin with, there is the medium growth from the 1945 wood—now two years old. It ought to be pruned hard. Then you have the 1946 growth—the young wood—and it should be pruned lightly by cutting out the flower heads down to the first growth bud. In a nutshell, it means that you have two types of wood on your plants, and proper pruning consists in cutting all two year wood hard back, right down to one or two eyes of the original growth. All one year growth should be lightly pruned.

I said at the beginning of this lecture that we would go back for a century in order to see what kind of Roses they grew in those days, and in conclusion I mention the various classes that were in existence at that time. Even in those days they were complaining about too many varieties. In the Scotch Roses, for example, there were over 300 sorts—to-day about half a dozen only exist. But a century ago Roses were divided into two sections, viz. Summer Roses and Autumn Roses. In the first section they had the Provence or Cabbage Roses; the Moss Roses; the French or Gallica Roses; the Hybrid Provence Roses; the Hybrid Chinas which, by the way, consisted of some very beautiful varieties; the Alba Roses; the Damasks; the Scotch Roses; the Sweet Briars; the Austrian Roses; and a few Climbers such as the Ayrshires, Multifloras, and Banksians.

For the Autumn Rose Garden they had what they called Perpetuals, but these must not be confounded with the more modern race of Hybrid Perpetuals. Very few of that old class could be found in cultivation to-day, and the only survivor so far as I am aware is 'Stanwell Perpetual.' Then came the Hybrid Perpetuals, or the first of what was to be a great class, but the kinds then grown were nothing like the latter accessions to that noble section. Typical kinds of a century ago were 'Comte de Paris' and 'Madame Laffay.' The Bourbons, of which 'Paul Perras' is a notable and lovely survivor, were great Autumn Roses of those days, and we owe a lot to that section in the development of our modern kinds. Then they had the China Roses, amongst which there were some very lovely things, and a few still survive in old gardens; then there were the Tea Scented Chinas as they termed them at that time, and I think 'Devoniensis' is about the only survivor. Then the miniature Roses such as 'De Meaux'; the Noisettes, of which 'Amiée Vibert' is a notable example; the Musk Roses—quite different, of course, from the fine sorts evolved by the late JOSEPH PEMBERTON. Then there were the Macartney Roses, and one or two forms of *R. microphylla*. There were many varieties in each section.

They grew them as bushes and they did not prune them severely. They had a fine show of flowers in their seasons such as they then were. They had their Summer Roses and their Autumn Roses, but they had not flowers over so long a period as we have. There were some very

beautiful Roses amongst them, and the late Mr. EDWARD BUNYARD did much to try and save the best of them from oblivion.

Finally, we can have, in our modern Rose Gardens, the splendid and impressive Rose bushes of our forefathers, but what a difference there will be. We can have flowers from May until December, and we can have Roses for the exhibitor if he wishes them; we can have Roses in abundance in the garden on dwarf or tall bushes to please almost any taste, and Standards can be had to please the admirers of that peculiar type. And our Roses of to-morrow, although they will be produced in much greater abundance, than in the past and over a very much longer time, are just as sweet and incomparably more beautiful than the Roses of long ago, fine as some of those were.

Consider the wide selection that is now available. Many of our older Roses in the Hybrid Tea section, now long discarded simply because they were incapable of producing exhibition flowers, are almost lost to cultivation, and they were superb when grown as bushes and treated less drastically in the way of pruning than by the orthodox method. One or two examples will suffice. What, for example, was more lovely than a big bush of 'Konigin Carola' (TURKE, 1903), with its satiny rose-coloured, large flowers borne singly in great profusion? Or where could a more charming, elegantly furnished bush, laden with large pearly blush and salmon-coloured flowers with their exteriors so lavishly tinted with brilliant vermilion, be found to rival 'Mrs. Wakefield Christie-Miller' (MCGREDY, 1909)? And what is more charming than a well-grown bush of 'Souvenir de la Malmaison' (BELUZE, 1843)? With all our modern crimson Roses, which of them can rival 'Gruss an Teplitz' (GESCHWIND, 1897), with its masses of brilliant scarlet-crimson flowers? Grown as a bush and left practically alone except for an occasional thinning out, what a sight it is. Rose 'à Parfum de l'Hay' (GRAVEREAUX, 1903), with its crimson flowers of ethereal fragrance, is one of the best of all the dear crimson Roses, and with all its beauty and perfume it is but little known and grown.

These are some of the older Roses worth growing—there are many others—along with some of the more modern kinds. They are of but little use, none at all in fact, to the man afflicted with the exhibition mentality, but they are gems to those people who admire and appreciate unsophisticated and simple beauty. Older still are many of those fine garden Roses so faithfully dealt with by the late EDWARD BUNYARD in his delightful book *Old Garden Roses*, and his efforts certainly did much to restore many fine old sorts to our gardens.

Then, of course, in addition to those ancients we have many modern sorts which, in association with the best of the ancients and some of the peerless old Teas, will afford post-war rosarians a selection of the widest kind embracing a really magnificent collection of splendid flowering shrubs. And to that diverse and wonderful selection can be added many of the species. In the past their cultivation has been somewhat neglected, but what can rival the exquisite beauty of such species as *R. hispida*, *R. Moyesii* and *R. Andersonii*, to mention only three? And as for climbers amongst the species let anyone try *R. moschata* var. *floribunda* on an old tree, and let it ramble at free will amongst the branches. It will clothe the whole tree with its distinct foliage, and in due season its great trusses of single white flowers, their beauty enhanced by their rich golden anthers which are so prominent in the centre of each blossom, borne in such great abundance that the foliage is almost obliterated, will scent your garden and its surroundings

with their delightful fragrance. Another of almost equal vigour and floral opulence is *R. Russelliana*. Its fragrance is not so pronounced as that of the last named, but it is very strong and delightful.

A word before I close on that charming Rose called 'Mermaid.' It is a hybrid from *R. bracteata*, and is a worthy daughter of a charming race. It is certainly one of the best of the single yellow Roses, and its lovely flowers—for they are very lovely—are carried in large trusses, foiled with most attractive foliage, and are in evidence over a long period from July onwards. It is generally grown as a climber on a wall, fence, pergola or pillar, but try it as a bush. Give it plenty of room for it is a vigorous grower, and look forward to one of the finest examples of floral beauty that could possibly be found in any garden from any plant or shrub. To those who have only seen this fine Rose crucified on wall or wood, I have but one thing to say: Give it its freedom and try it as a bush.

I have spoken of the long flowering period that is now such a marked characteristic of our modern Roses, and I have also spoken of Roses on their own roots. Let me finish by giving a quotation from MAETERLINCK which seems pertinent:

"As for the luxurious flowers that seem to possess no other object than themselves, they have long abandoned the endeavour to solve the mystery of this boundless summer. They no longer score the seasons, no longer count the days; and, knowing not what to do in the glowing disarray of hours that have no shadow, dreading lest they should be deceived and lose a single second that might be fair, they have resolved to bloom without respite from January to December. Nature approves them and, to reward their trust in happiness, their generous beauty and amorous excesses, grants them a force, a brilliancy and perfumes which she never gives to them that hang back and show a fear of life. . . . After all, we have here a very real fact, namely, that we live in a world in which flowers are more beautiful and more numerous than formerly; and perhaps we have the right to add that the thoughts of men are more just and greedier of truth."

THE AWARD OF GARDEN MERIT.—LXXV.

323. BAPTISIA AUSTRALIS.

Award of Garden Merit, July 23, 1945.

Baptisia australis, sometimes known as the False Indigo, is an old inhabitant of gardens, having been grown by Phillip Miller in 1758; it is a native of North America and makes a fine spreading bush from 3 to 5 feet in height; the leaves are trifoliate, the leaflets being broad and shortly tipped. In June and July the plant is covered with flowers in terminal, branching spikes; each pea-shaped flower is about 1 inch across, and bright indigo blue. A deep rich soil in a sunny position suits it best; it can be propagated by seed, or by division in early spring. Under the name *Sophora australis* this *Baptisia* is illustrated in the *Botanical Magazine* t. 509.

INSECT PESTS OF *COTONEASTER HORIZONTALIS*.

By G. FOX WILSON.

Entomologist, R.H.S. Laboratory, Wisley.

SINCE its introduction from China in 1879, the attractiveness of *Cotoneaster horizontalis* as a hardy, ornamental shrub suitable, owing to its dwarf spreading habit, for clothing walls, steep banks, rocks and steps has long been recognized—it having received the Society's Award of Garden Merit in 1925 (R.H.S. JOURNAL, 1926, 51, 84).

Unfortunately, however, certain indigenous species of insects have become pests of this shrub, and the ever-increasing number of inquiries has demanded a note on those chiefly concerned in attacks in gardens and of measures for their control.

The flowers of this *Cotoneaster* prove specially attractive to Queen Wasps, and many Fellows make a practice of capturing the females on the blossoms in spring in an endeavour to reduce the local Wasp population.

The pests recorded at Wisley and elsewhere (see Map) on *C. horizontalis* are :

A. Order Hemiptera—Homoptera.

- (1) Woolly Aphis, *Eriosoma lanigerum* Hausm.
- (2) Green Apple Aphis, *Aphis pomi* De Geer.
- (3) European Brown or Peach Scale, *Lecanium corni* Bouché.
- (4) Mussel Scale, *Lepidosaphes ulmi* L.

B. Order Lepidoptera.

- (5) Lackey Moth, *Malacosoma neustria* L.
- (6) Pyralid Moth, *Eurhodope suavella* Zinck.
- (7) Bud Moth, *Spilonota ocellana* Fabr.
- (8) Tortricid Moth, *Ancyliis achatana* Fabr.
- (9) Hawthorn Webber, *Scythropia crataegella* L.

A. Order Hemiptera—Homoptera.

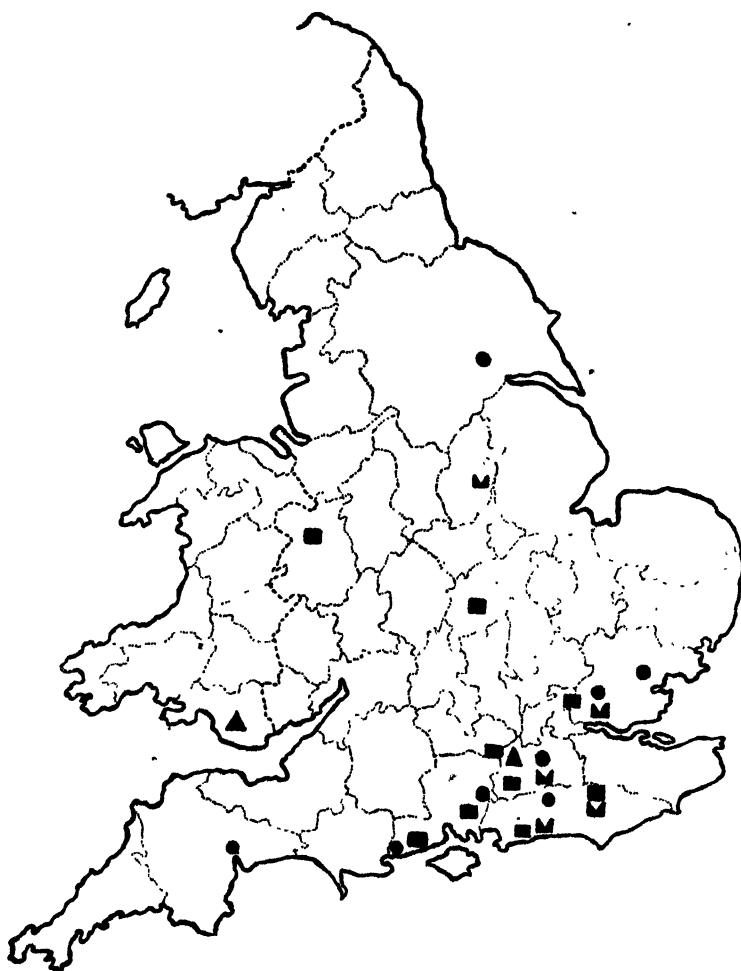
(1) *Woolly Aphis*.—This well-known Apple pest, often referred to as 'American Blight,' has long been known as a pest of *C. horizontalis* (5, 9), and was first observed on this host in 1907 by Mr. F. J. CHITTENDEN, late Director of Wisley (*in litt.*). It has been recorded from the Continent on this shrub in Denmark (4), France (2, 10), and Germany (3, 7), while colonies parasitized by the Chalcid, *Aphelinus mali* Hald., were found at Rouen (1).

Wall-trained plants are often heavily infested with Woolly Aphis which, in sheltered situations, overwinter on the branches (Fig. 84). It would appear that a biological race is concerned for our attempts to transfer Aphides bred for several generations on *Cotoneaster* to Apple have so far been unsuccessful, while those reared on Apple have not been induced to become established on *Cotoneaster*.

The presence of large colonies of this pest is not only unsightly, but growth is checked, small tumours develop and malformation of the shoots occur.

Control.—The application of a 5 per cent. Tar-distillate wash in December will prove effective in controlling an outbreak, especially if the wash is applied forcefully and directed to the inner sides of the

branches which, being devoid of leaves at this season, are more readily reached than during the growing season. Outbreaks during the spring and summer are more effectively controlled by means of a dust than a wet spray, and Nicotine dust should be applied at high temperatures (*i.e.* above 65° F.) when the vapour permeates through the bush and reaches the colonies situated near the support-wall.



- ▲ Peach or European Brown Scale, *Lecanium corni* Bouché.
- Woolly Aphis, *Eriosoma lanigerum* Hausm.
- Web-spinning Tineid Caterpillar, *Scythropia crataegella* L.
- Ⓜ Pyralid Moth, *Eurhodope suavella* Zinck.

FIG. 87.—COUNTY RECORDS OF FOUR MAJOR PESTS OF *Cotoneaster horizontalis* BASED UPON MATERIAL SUBMITTED TO THE WISLEY LABORATORY.

(2) The Green Apple Aphis is a less common pest on *C. horizontalis* than on other species, e.g. *C. frigida*, but eggs of this aphis were found on shoots of wall-trained plants at Wisley in November, 1921. These eggs develop into olive-green Aphides on the shoots in spring though leaf-curl has not been found to occur on this host.

Control.—See (1).

(3) The European Brown, Fruit or Peach Scale is a polyphagous species and attacks a number of fruits (Currants, Gooseberry, Peach and Nectarine) and ornamental trees and shrubs (Azara, Carpentaria, Ceanothus, Escallonia, Lonicera and Wistaria). Severe infestations occur on *C. microphylla*, which is a somewhat more favoured food plant than *C. horizontalis* (9).

The eggs are deposited beneath the old female scales during June and July, and hatch in July and August into minute, light brown, oval scales which wander about over the foliage for a time before settling down on the shoots and branches to overwinter. They become active again in the spring, but soon settle down to a sedentary existence, and develop into mature scales which are reddish-brown, somewhat oval, flat underneath and highly convex above (Fig. 85). A pale scar is left on the shoot when the scale is detached.

Control.—Winter spraying with a 5 per cent. Tar-distillate wash destroys the immature scales, but special care must be taken to direct the wash to the inner sides of the branches which are the chosen site for overwintering. The most effective wash for destroying the immature scales during the period September to March is a Nicotine and White Oil emulsion (Nicotine, 95–96 per cent.— $\frac{1}{4}$ fl. oz. ; White Oil emulsion— $\frac{1}{2}$ pint ; Water—10 gallons).

(4) The Mussel Scale is one of the most abundant Scale insects in the British Isles, and is a serious pest in neglected Apple orchards. It attacks a number of other fruit trees, including Apricot, Cherry, Currants, Gooseberry, Nut, Peach, Pear and Plum, and such ornamental trees and shrubs as *Ceanothus*, *Cotoneaster microphylla* (9) and *Pyrus* species.

Control.—See (2). The fact that (i) this Scale overwinters in the egg stage and not in the nymphal stage, and (ii) the eggs hatch in May and not in July demands a spring rather than an autumnal or late winter application of the Nicotine and White Oil emulsion to effect a satisfactory control of the immature stages.

B. Order Lepidoptera.

Several species of Moths have been recorded as pests of *C. horizontalis*, and notes on those occurring in this country will follow. Three further species have been recorded on the Continent, namely, *Gelechia vepretella* Zinck. (8) ; *Argyresthia sorbiella* Triets., and *Depressaria cotoneastri* Nick. (13) ; while what is termed the Cotoneaster Webworm, *Cremona cotoneastri* Busck., is recorded from Oregon (12). The last mentioned proved to be a new species of Gelechiid Moth, which was first noted in 1929 and again in 1933–4. Its Asiatic origin was suspected owing to its host plant being indigenous to China. The caterpillars “web” the shoots, and live in silken tubes in a manner comparable to *E. suavella* in this country.

(5) The Lackey Moth is a familiar pest of fruit trees in the Home and Southern Counties, where the “nests” or “tents” of the caterpillars are often conspicuous on fruit trees, especially Apple, on

Hawthorn, and on various ornamental trees and shrubs, including *C. horizontalis*.

The moths appear in late July and August, when the female deposits a bracelet of eggs, comprising a mass of 100–250 eggs, on the shoots. The caterpillars, which are grey in colour with yellowish-red stripes on the back and sides and hairy, hatch out during late April and May. They are gregarious and live in a "tent" made of silk. They speedily defoliate the shoot upon which the "nest" is situated and, after moulting, move to another branch upon which a larger and more elaborate "tent" is made. When fully fed they move away and each pupates in a silken cocoon on the stem, between the leaves and the shoots, and among dry rubbish nearby.

Control.—It is sufficient in the case of attacks on Cotoneaster to cut off and burn the "tents" as soon as they appear, while odd caterpillars are readily killed by lightly spraying the foliage with an arsenical wash (*i.e.* 1 oz. lead arsenate paste to 1 gall. water).

(6) The Pyralid Moth, *E. suavella* Zinck., was first noted at Wisley in June 1930 on *C. horizontalis* and *C. microphylla*. Further records of this species on *C. horizontalis* have been made in this country (13) and in Austria (11). Some confusion exists between the damage caused by the caterpillars of this Moth and by those of the Hawthorn Webber, *S. crataegella* L., owing to the fact that the larvae of both species live in silken galleries on the shoots and branches, and may occur on the same bush.

The larvae are dark reddish-brown in colour with a dark brown head, and live in silken galleries on the branches from September to the following May and June when they pupate among the webbing. The adult Moths have purplish-tinged and reddish forewings and somewhat resemble Tortricids in general appearance. They are on the wing during June and July, when eggs are laid normally on Hawthorn and Sloe.

Severe defoliation may occur during September and October prior to leaf-fall. The caterpillars overwinter in their webbing, and recommence feeding in April and May.

Control.—The application of a Nicotine dust at high temperatures in the autumn and/or early spring will effectively control this pest, while an arsenical wash applied to the foliage will avoid further injury.

(7) The Bud Moth is more generally recognized as a pest of Apple and other fruits including Cherry, Pear, Plum, Raspberry and Blackberry. The reddish-brown and black-headed caterpillars appear in August and September, at which time negligible damage is done to Cotoneasters (13). After hibernating within silken cocoons, however, the larvae become active in spring, when they draw together a few leaves and live in webs on the shoots, feeding on the foliage.

Control.—See (6).

(8) *Ancylis achatana* Fabr. was first noted at Wisley in 1925 on *C. horizontalis* and *C. microphylla*. The tawny brown caterpillars were found feeding on the foliage during May, and the adult Moths emerged on June 18, 1925. The normal food plants of this species are Hawthorn and Sloe, but records of infestations upon Cotoneasters have been made in the British Isles (13) and in Hungary (8).

Control.—See (6).

(9) The Hawthorn Webber is a Tineid Moth whose caterpillars live normally on Hawthorn, often enveloping the bush with a dense gauzy web (6). This pest was first noted at Wisley in June, 1929, on *C. hori-*

zontalis and *C. microphylla*, and has been recorded on the former host from Hungary (8).

The small, dull reddish-brown caterpillars live during May and June in a common web on the branches fouling the shoots with their silken threads and excreta (Fig. 86). The range of this species on Cotoneaster is increasing, and a large number of inquiries concerning this pest has been received during the past two years from several counties (see Map). The naked pupae are distributed throughout the texture of the web and the minute Moths, whose white forewings are sprinkled with light and dark fuscous markings, emerge from mid to late June.

Control.—See (6). The early application of a Nicotine dust is advisable as penetration of the vapour into the dense webbing of a large colony is difficult.

Recent investigations with "D.D.T." both as a 5 per cent. dust and as an emulsion in oil have demonstrated the value of this new synthetic insecticide against leaf-eating caterpillars on Cotoneaster.

Acknowledgments.—The author expresses his sincere thanks to his colleague, Mr. F. C. Brown, for the photographs illustrating this article; and to his assistant, Miss P. S. Shilton, for preparing the map.

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PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Campanula laciniata. A.M. May 29, 1945. A handsome, monocarpic species raised from seed collected in Crete by Mr. Peter Davis. The erect, glabrous stem attains a height of about 2 feet, producing near the top about a dozen short branches, each bearing three to five flowers. The cup-shaped corolla is $2\frac{1}{2}$ inches across, in colour Sea Lavender Violet (H.C.C. 637/2) with a white base. The lustrous, pale green basal leaves are 6 inches long and have about five pairs of short, toothed lobes. Exhibited by Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead. See p. xliii.

Delphinium 'Blue Lagoon.' A.M. May 29, 1945, as an exhibition variety. Flower spikes $2\frac{1}{2}$ feet long, pyramidal, with semi-double flat flowers $2\frac{1}{4}$ inches diameter, symmetrically arranged, a tone of Gentian Blue (between H.C.C. 42 and 42/1) slightly flushed with a Tyrian Rose sheen (H.C.C. 24/2); eye large, brown with yellow hairs. Raised and shown by Mr. F. A. Bishop, The Glade, Clewer Green, Windsor. See p. xliv.

Lilium 'Burnham Orange.' A.M. May 29, 1945. A seedling from *L. Scottiae*. The stem is about 2 feet high and bears an umbellate, 6- to 8-flowered inflorescence. The Orange (H.C.C. 12) perianth

segments, of which the inner are ovate and $2\frac{1}{2}$ inches long and the outer narrower, are slightly spotted and recurved at their tips. Exhibited by Messrs. W. A. Constable, Ltd., Burnham, Bucks. See p. xliii.

Rhododendron 'Albatross,' Townhill form. A.M. May 29, 1945. In this form of the hybrid, whose parents are *R. Loderi* 'King George' and *R. discolor*, the flowers are up to $5\frac{1}{2}$ inches across; they are borne in large trusses, each flower being wide-funnel shaped, the petals waved at the edge; the colour is Fuchsine Pink (H.C.C. 627/3), and in the fully opened flower persists chiefly on the backs and edges of the petals, the centre being almost white and without spots. Shown by the Rt. Hon. Lord Swaythling, Townhill Park, Southampton. See p. xliv.

Rhododendron cinnabarinum var. Blandfordifolium. A.M. May 29, 1945. The specimen shown was a fine form of this variety; the flowers are nearly 2 inches long and $1\frac{1}{2}$ inches wide, the tube being almost straight for the first inch, then expanding into five neat, rounded segments. At the base the colour is bright red (H.C.C. 18), becoming paler, whilst the inner surface is a lighter red (H.C.C. 18/2) over Apricot (H.C.C. 609/2), giving a combination of colour approximating to H.C.C. 16/2. Shown by Lord Aberconway, Bodnant, Tal-y-Cafn, N. Wales. See p. xliv.

Rhododendron 'Grosclaude.' A.M. May 29, 1945. This hybrid between *R. haematodes* and *R. eriogynum* bears 10-12 flowered trusses of waxy campanulate flowers, 2 inches long and $2\frac{1}{2}$ inches wide, the petals being slightly waved at the edge. The colour is Blood Red, H.C.C. 820/1. Shown by Major Edmund de Rothschild, Exbury, Southampton. See p. xliv.

Rhododendron 'Mohamet.' A.M. May 29, 1945. The parentage of this hybrid is *R. dichroanthum* and *R. 'Tally-ho'*; it bears 5-6 flowers in the truss, each being 2 inches deep and $2\frac{1}{2}$ inches across, with a very large calyx, of the same red colour (H.C.C. 19/1) as the corolla; on the inside the colour is concentrated towards the slightly frilled edge, the centre of each petal being rather yellower. Shown by Major E. de Rothschild. See p. xliv.

Rhododendron 'Mosaïque.' A.M. May 29, 1945. This distinct little plant is a cross between *R. ambiguum* and *R. Cinn-keys*. The leaves are small and pointed; there are about a dozen flowers in each truss, each flower being about 1 inch long and $\frac{3}{4}$ inch across. The tube is narrow for half the distance and bright red at the base (H.C.C. 020/1); it widens gradually to five narrow lobes which do not expand very fully; these are pale yellow (H.C.C. 3/3). Shown by Major E. de Rothschild. See p. xliv.

Rhodohypoxis Baurii 'Major.' A.M. May 29, 1945. An unusually darkly-coloured form of this attractive little plant, with flowers of Indian Lake (H.C.C. 826/3), raised by the exhibitor. The leaves are 3 inches long, narrow-oblongate, and clothed with white hairs. The perianth is composed of six spreading segments, the outer narrow-ovate, $\frac{1}{2}$ -inch long, the inner smaller and pleated. Exhibited by Mrs. Garnett-Botfield, Beamish, Albrighton, Wolverhampton. See p. xliii.

Typha minima. A.M. May 29, 1945. A graceful species of Reed-mace with narrow, channelled leaves about 2 feet high and many erect, wiry stalks bearing at their tips the fluffy staminate spikes and immediately beneath these the dense, elliptical, rusty-brown seed-heads, each subtended by a long, narrow bract. This is a useful plant for the margins of small pools, growing best in water not over 5 inches deep. Exhibited by Mr. Amos Perry, Enfield. See p. xliii.

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THE SECRETARY'S PAGE.

Subscriptions.—The attention of the Fellows and Associates is drawn to the September JOURNAL containing the message of the President in respect to the subscriptions for 1946 and onwards, and they are asked to tell friends desiring to join the Society that a full year's subscription, from October 1, 1945, will entitle the new Fellow or Associate to all the privileges of the Society until January 1, 1947. Owing to the change that has been made it would be of great assistance to the administration if the Fellows and Associates would bear this in mind when sending their subscriptions. The subscription renewals at the new rates will take place on January 1, 1946.

Programme of Meetings.—The Fruit and Vegetable Show will be held on Tuesday, October 2 (12.30–5 P.M.) and Wednesday, October 3 (10 A.M.–5 P.M.), and on this date there will be a Flower Arrangement competition for professionals. Schedules for this Show and competition may be obtained on application to the Secretary. In conjunction with this Show there will be competitions for Perpetual-flowering Carnations, organized by the British Carnation Society, and competitions for Chrysanthemums, under the auspices of the National Chrysanthemum Society.

There will be a Show on Tuesday, October 16 (12 noon to 5 P.M.), on which occasion there will be competitions for Berried Shrubs and Coloured Foliage, entry forms for which may be obtained from the Secretary.

Lecture.—On October 2, at 2.30 P.M., in the Lecture Room of the New Hall, Greycoat Street, S.W. 1, there will be a lecture by Dr. T. Wallace on "Practical Aspects of the Manuring of Fruit." Members of the Fruit Group are particularly requested to note this lecture.

Chrysanthemum Show.—On Tuesday, November 6, there will be a

Chrysanthemum Show under the auspices of the National Chrysanthemum Society on this Society's premises. Fellows will be admitted free on presentation of their R.H.S. tickets.

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during October and November :

Vegetable Garden.

October 10, 11 . Digging, Trenching, Manuring and Composting 2-4 P.M.

Fruit Garden.

November 7, 8 . Planting of Fruit Trees and Roses . 2-4 P.M.

Fellows and Associates desiring to attend should notify the Director of the R.H.S. Gardens, Wisley, Ripley, Surrey, of their intention.

How to get to Wisley.—Fellows and Associates desiring to travel from London to Wisley should take a train from Waterloo to Kingston and there pick up the bus No. 215, which will stop on request at the turning for the Gardens on the Portsmouth Road. For the times of the bus No. 215 inquiries should be made at the London Passenger Transport Board, 55 Broadway, London, S.W.1. (Tel. Abbey 1234), and for particulars of the trains, the current time-table should be consulted or inquiries made at Waterloo Station (Tel. Waterloo 5100).

Fruit for Naming.—At this time of the year many Fellows and Associates desire to have fruit named, and it would be a great convenience if the following rules for sending fruits for identification were followed :

Send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it was gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, *e.g.* indoors or out, as cordons, bushes, or standards, etc.

Specimens should be sent to the Director of the R.H.S. Gardens, Wisley, Ripley, Surrey.

R.H.S. Gardeners' Diary, 1946.—It is expected that copies of the R.H.S. Gardeners' Diary will be available towards the end of this month, and orders with remittances may now be booked. The Diaries, as last year, will be in short supply. The selling price, including purchase tax, is as follows :

In Pluviusin <i>without pencil</i>	3s. 1d., post free.
In Morocco leather <i>with pencil</i>	6s. 4d., post free.
Refills for Crocodile Cases	2s. 4d., post free.

Examination Results :

Teachers' Advanced Examination in School and Cottage Gardening, held on June 13, 14 and 15, 1945.—Fifty-three candidates entered for this Examination, and of these 35 passed and 18 failed.

National Diploma in Horticulture, Preliminary Examination, held on June 4, 5, 6, 7 and 8, 1945.—Sixty-four candidates entered for this Examination, and of these only 12 passed and 52 failed.

National Diploma in Horticulture, Final Examination, Section I (General Horticulture), held on June 26, 27, 28 and 29, 1945.—Thirty-seven candidates entered for this Examination, and of these 13 passed and 24 failed.

The following have been awarded the National Diploma in Horticulture :

Section I—General Horticulture.

Beddall, John Leslie	Kidner, Iris Mary
Buckhurst, Charles Douglas	Mellard, Derrick
Cochrane, Henry Simpson	Shrubsole, Hilary Castelfranc
Crosbie	Souster, John Eustace Sirett
Freke, Ethne Norah	Stokes, Joan
Gaussen, Kathleen T.	Thrower, Percy John
Johnston, Ralph Edwin	Toleman, Eric Edwin

Section II—Hardy Fruit Growing.

Hughes, Hilary Mary	Webb, Frederick William
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Section V—Landscape Gardening.

Bishop, Cpl. Reginald Harold, R.A.F.

Section VIII—Horticultural Teaching.

Shepherd, Frederick William

WISLEY IN OCTOBER.

THE autumnal colouring of trees and shrubs will be at its height during the present month, and a visit to the Gardens is worth while for this alone, although there will still be some flowers on the Dahlias, Chrysanthemums and Michaelmas Daisies, unless their display has been brought to an untimely conclusion by a severe frost before the end of September, as sometimes happens. October is not notable for prolonged periods of settled weather, but it almost always brings a few days of genial sunshine to enhance the colour of leaf and berry, and on such days many quite ordinary plants reveal unsuspected merit.

The brightest show of colour is to be seen in Seven Acres, where a good many *Berberis* species and hybrids are carrying crops of ripening berries. *B. Jamesiana*, *B. rubrostilla* and *B. Wilsonae* are examples of the host of red-fruited kinds ; *B. lycioides* and *B. pruinosa*, whose purple berries are heavily coated with white bloom, and *B. gyalatica*, bearing purplish-black clusters on arching branches, are handsome plants, although less suitable for small borders.

The Crabs, invaluable earlier in the year when covered with their lovely pink or white blossom, are again brought into prominence by their crops of red or yellow apples, some comparatively large as in *Malus baccata* and *M. Niedzwetzkyana* and its richly-tinted hybrids, others smaller like those of *M. Sargentii* and *M. theisera*. The Sea Buckthorn, *Hippophae rhamnoides*, is notable for the long persistence of its plentiful orange berries, and the various species of Cotoneaster,

Euonymus and *Pyracantha* likewise make a substantial contribution to the general effect.

The Heath garden is still colourful, with plenty of bloom on the later Heathers and some varieties of the Cornish Heath, and even the rusty-brown spikes of those which have passed out of flower are not unsightly. Coloured foliage is abundant everywhere, and there is usually a succession of brilliant things, some very fleeting, others of more lasting beauty. *Rhus Cotinus* beside the pond, *R. typhina* and *R. Potaninii* in the borders, achieve a fiery scarlet for a short time; *Parrotia persica*, in a dappled garb of orange, bronze and crimson, drops its leaves somewhat reluctantly; while those of *Quercus coccinea* pass gradually through the richest vinous red to a sombre brown. *Hamamelis mollis* and *Ginkgo biloba*, the Maidenhair-tree, change from green to clear yellow before reaching their final russet.

The Pinetum provides an admirable setting for the young specimens of *Liquidambar* growing at the south end. Some other finely coloured shrubs planted among the conifers are *Rhus copallina*, *Cotoneaster Wardii*, *Berberis Thunbergii* and *Viburnum Sargentii*. On Battleston Hill certain trees and shrubs become conspicuous at the present time against the background of evergreen *Rhododendrons*. *Acer pennsylvanicum* and *A. platanoides* are among the Maples whose foliage turns yellow before falling, *Photinia villosa* has red berries in addition to leaves of orange and scarlet, while *Rhus trichocarpa* has yellow leaflets borne on red petioles. The greatest mass of colour, however, is displayed by the common *Rhododendron luteum* (or *Azalea pontica*) planted on either side of the broad walk and in a long bed at the top of the hill, and now clothed in scarlet, purple and bronze.

In the Rock garden a good many plants are still flowering. *Gentiana sino-ornata* is the most noteworthy of its kind, for it continues to open fresh blooms for many weeks in spite of adverse weather. *Cyananthus microphyllus*, too, sprinkles its neat mats of foliage with a long succession of pale blue stars. The last of the Saxifrages, *S. Fortunei*, is now sending up panicles of feathery, white blossoms from rosettes of large, crimson-stained leaves.

Autumn-flowering bulbous plants, beginning to be effective when most of the ordinary herbaceous species are going over, are particularly welcome. The collection of Crocuses in the beds near the Alpine house will be worth a visit on sunny days. In the dry border along the north side of the Rock garden the narrow-petalled, pink heads of *Nerine Bowdenii* are appearing with the larger, scented *Amaryllis Belladonna*. Both of these indispensable plants also brighten the borders on the south and west sides of the Laboratory, where they have the warmth and shelter they enjoy. The golden, Crocus-like *Sternbergia lutea* is a plant of similar requirements, and is seen at its best near the end of one of the glasshouses, in company with many other choice and somewhat uncommon things.

It is too late in the year to expect to find many flowers in the Alpine house; but in some plants such as *Helichrysum frigidum* and the species of *Acantholimon* the faded inflorescences are decorative, and a number of others have foliage of attractive form and colouring. The few flowering specimens include *Iberis sempervirens*, a small, white Candy-tuft which blooms all through the winter, *Limonium ornatum*, a dainty, rose-coloured Sea-Lavender, *Oxalis lobata*, a bright, yellow-flowered Wood Sorrel, and *Hypoxis villosa*, with umbelled blossoms of the same colour.

GARDEN WORK.

REMINDERS FOR OCTOBER.

Vegetable Garden.—This is a good time of the year to break up grass-land for vegetable growing. Bastard trench, at the same time burying the turf, but no manure should be necessary. It is also a good time to commence bastard trenching cultivated ground for such crops as Peas, Beans, Onions, etc.; in this instance apply farmyard manure or garden compost unless the soil is exceptionally fertile.

Complete the earthing of Celery towards the end of the month, before frost becomes severe. The earliest Leeks should benefit by a little soil being pulled up to their stems for the purpose of blanching.

Cut down Asparagus foliage as soon as this has turned yellow and before the berries fall; clear the beds of weeds and give a top dressing of well rotted manure.

Lettuces sown during late August for overwintering should be ready for transplanting early this month; choose a favourable position and, in order to allow for casualties, place the plants about 4 inches apart with a foot between the rows. It is important not to plant the seedlings too deeply or they may rot at the collar. If Spring Cabbages have not already been planted or, in those instances where it is intended to plant a second batch, this should be completed by the middle of the month.

One of the best methods of storing Onions is to form them in ropes and suspend in a cool dry shed. When the bulbs are sufficiently ripened this is work which could conveniently be done on a wet day.

Maincrop Potatoes which have ripened their growth should be lifted; choose fine weather and allow the tubers to remain on the ground for a few hours to dry; store either in a clamp or cool frost-proof shed. Lift the maincrop of Beetroots and Carrots and store in a suitable place; late sowings of these crops can remain in the ground until later in the season.

Choose a time when the plants are dry to remove the yellow leaves from Brussels Sprouts, Cabbages, etc., and place on the compost heap, also transfer rubbish and the remains of crops that have ceased to be useful to the compost heap as, apart from exhausting the soil, they give a neglected appearance to the garden. Cabbage stumps should be roughly stacked with the object of drying them before burning as a means of reducing the chance of attack by Cabbage Root Gall.

Fruit Garden.—Where it is intended to plant fruit trees and bushes during the coming autumn, if not already done, the ground should be thoroughly prepared by deep digging, but, in the case of tree fruits such as Apricots, Apples, Cherries, Peaches, Pears and Plums, no farmyard manure should be added. The addition of Bonemeal, Potash and Lime will depend on the soil's requirements in these respects. When preparing for bush fruits such as Black and Red Currants, Gooseberries, Raspberries, etc., a dressing of farmyard manure or garden compost is usually necessary.

Unproductive, vigorous-growing, trained trees of Apricots, Cherries, Plums and Peaches can now be root-pruned. Young trees can be lifted out of the ground and their coarse roots cut back before re-planting; older trees should be partially root-pruned.

If, for some reason, it has not been possible to plant out Strawberry runners during the past two months, the present time is quite

suitable but, in this case, it will be advisable to de-blossom the plants during the coming spring in order to produce strong plants for fruiting the following year.

About the end of the month is a good time to make a new plantation of Raspberries on ground which has been thoroughly cultivated and manured. Procure canes from a reliable source supplying only good clean stocks true to name.

As soon as the fruits of Peaches and Nectarines are gathered cut out as much of the old bearing wood as necessary and regulate the new shoots in order that they become thoroughly ripened.

In those instances where good results are likely to be obtained from grease banding, early in the month place bands round the trunks of fruit trees and endeavour to keep the bands tacky throughout the winter.

The majority of the late keeping Apples and Pears should be gathered and stored during the present month with the exception of the very latest varieties, such Apples as 'Allen's Everlasting,' 'Court Pendu Plat,' 'Sturmer Pippin,' etc., and Pears 'Easter Beurré,' 'Oliver de Serres,' 'Passe Crassane,' etc., which would benefit by hanging on the trees until early November.

Flower Garden.—If not already done prepare ground by thorough cultivation and manuring where it is intended to plant Roses next month.

As soon as the summer display has ended clear the beds and replant with bulbs, Polyanthus, Wallflowers, etc., to provide a spring display. Delay the planting of Tulips until next month. Transfer from nursery beds to flowering positions such plants as Canterbury Bells, Sweet Williams, Wallflowers, etc.

Providing soil conditions are favourable the present month is a good time to replant the herbaceous border. For planting use vigorous pieces from the outside of the old clumps of the various perennials and replant in well-defined groups.

Where favourable soil conditions exist for the autumn planting of hardy Lilies, the present is a good month for this work. Where conditions are not so favourable it is better to pot the bulbs and winter in a cold frame.

Where it is intended to form new lawns or renovate old ones by turfing, the present is a good time providing the ground is moist enough for the new turves to be lifted and relaid successfully.

Thin out annuals sown in September to about 2 to 3 inches apart as soon as the seedlings are large enough.

Be prompt in clearing away fallen leaves from the rockery ; keep the plants free from weeds and see that the weaker-growing species are not overrun by their more vigorous neighbours.

When frost has destroyed the foliage of Dahlias cut down the stems to within about 8 inches of the ground ; lift the tubers in favourable weather and dry well before placing in a frost-proof store. Tuberous Begonias, Gladioli and the choicer varieties of Montbretias should be lifted and stored.

Agapanthus, Fuchsias, Hydrangeas, etc., growing in tubs which have stood in the open during the summer months should now be transferred to a cold greenhouse or dry shed where provision can be made to give extra protection at those times when severe frost threatens.

Cold Greenhouses and Frames.—Cabbage Lettuces to overwinter

in frames should be sown early this month, 'May Queen' being a suitable variety. The seedlings of Cauliflowers sown last month should now be ready for pricking out, and it is advisable to make a further sowing this month of an early maturing variety.

Lift Endives and plant in a cold frame in which to winter or cover the plants with cloches in the position in which they are growing; blanch as required in each instance. In order to prolong their season of usefulness transfer well-developed plants of Lettuces to frames, or cover with cloches where they are growing.

Early in the month sow Sweet Peas in pots or boxes and place in a cold frame. When the seeds have germinated endeavour to keep the plants sturdy by providing as much light and air as possible on all favourable occasions. This is also a good time to sow seeds of Antirrhinums, Stocks, etc., in pots or boxes, placing in a cold house or frame for planting out in spring for early flowering.

Seeds of alpine plants are best sown immediately they ripen; if this has not already been done do not delay the operation. Sow in pots or boxes, cover with a sheet of glass and stand outside in a sheltered place at the foot of a north wall or similar position.

The present is a good time to sow seeds of hardy Lilliums in pots or boxes, placing them in a cold house or frame.

Where Border Carnations do not winter well in the open garden, pot the layers and place in a cold frame until spring; give the maximum of ventilation on all favourable occasions.

Continue to insert Viola cuttings as these become available; as soon as the earliest become rooted afford plenty of air.

Periodically examine bulbs in bowls, pots or boxes which were placed in plunging material or dark cupboards. When the pots are full of roots and 1 inch of new growth is visible, remove to a cold frame and shade for a few days; gradually accustom the plants to light. From this position introduce batches into warmer conditions as required.

As little water as possible should be used where bunches of Grapes are hanging in unheated vineries, and the fruit should be disposed of as soon as possible, the berries being apt to rot in low temperatures. As long as the bunches remain in the vinery continue to inspect them frequently and cut out all decaying berries to prevent wholesale rotting.

Continue to afford maximum ventilation to Peach and Nectarine trees growing under glass, syringe the trees each morning on all favourable occasions and do not allow the roots to suffer from lack of moisture. Except where it is known that the soil contains enough lime, the trees should benefit from a dressing of hydrated lime applied to the surface of the border at the rate of about $\frac{1}{2}$ lb. per square yard and watered in.

DIFFICULT PLANTS FOR THE ENTERPRISING AMATEUR.

By DAVID WILKIE.

(Lecture given on July 24, 1945 ; Mr. T. Hay in the Chair.)

CONDITIONS of soil and climate vary so much throughout the British Isles that we all, amateur and professional, have our black list of plants we fail to grow successfully. These so-called difficult plants can be divided into two groups: those transitory specimens which are nursed through a weakly seedling stage to depressed-looking plants with little foliage or flower to commend them, and the other group, which, after much careful handling and anxiety, compensate the grower with a display.

It is some of this latter group that I hope to show to-day, and I have no doubt there will be Fellows who wonder why I have included them as difficult plants. I have attempted to avoid stressing only those plants that cause us trouble at Edinburgh and have included a few which, I believe, have caused anxiety in the south. To avoid repetition of place names I have divided them into geographical sets.

Of European species, there are a great number that are troublesome, but this has not been so apparent with them as it would have been with plants of more distant lands. There have always been travellers from Britain to the Continent who have brought plants home, and also one or two nurserymen there who have traded with this country.

From the Swiss Alps we have *Anemone sulphurea*, often given as a variety of *A. alpina*. It is quite common in its native haunts, but not seen enough in our gardens and often growing but not flowering. When it does bloom, it amply rewards the long wait so often experienced by its owner. The flowers are borne on 12- to 15-inch stems, and are followed by the fluffy seed heads which are very ornamental.

The Balkans have always repaid the plant hunter, and among plants that are native are the *Asperulas*. *A. arcadiensis* is found on Mount Athos and is offered also as *A. suberosa* and *A. Athoa*, which is a dainty prostrate plant, the leaves silvery-grey and the tiny flower trumpets of a very pale pink.

Campanulas, the bulk of which are European, provide many beautiful plants and at the same time many problems. *C. hypopolia*, a native of the Caucasus, produces bells on 3- to 6-inch stems and has narrow greyish-green foliage. In the north, seed is difficult to get and cuttings prone to "damp off." I know that I am inviting comment in mentioning *C. Zoyzii*, but it is one of the loveliest of a fine genus. Beloved of slugs and all things that crawl, it is an added difficulty to protect it from these pests. It has tiny closed bells of pale blue on 2-inch stems.

With a wide distribution from the Pyrenees to Transylvania and Bosnia, *Callianthemum rutaefolium* is closely related to *Ranunculus* and is often included under that genus. A characteristic of this plant is that it blooms in the early part of the year, sending up the white flowers before the leaves are developed.

The genus *Edraianthus*, as it is now known, has suffered many changes of name. Most of them are natives of the Balkans, and of

these *E. Pumilio* has a densely tufted cushion of needle-like leaves, silvery-grey in colour and purple-blue (sometimes of a very pale shade) erect bells of an inch or so. Entirely different from this species is *E. serpyllifolius major*, a prostrate grower of deep green spoon-shaped leaves and deep purple wide open bells. It is still to be found under the name *Wahlenbergia*. One always associates the name *Linum* with blue flowers, but not all are blue-flowered. *L. salsoloides* var. *nanum*, a dwarfed form of the type, is a prostrate plant of short linear leaves and flowers of a very pale rose-lilac, often shading to white.

I regret that I cannot show you illustrations of any of the very difficult European *Primulas*, and the only one I have is *P. carniolica*. Rather different from the others, it has rosy-pink flowers on stems of 4 to 6 inches in height and bright green leaves. From the European Arctic north, and widely distributed in Europe, we have *Ranunculus glacialis*. It is only an inch or so high, with deep-cut leaves and large white flowers which are often flushed pink on the reverse.

During the last fifteen years and especially just before the War, there was a steady increase to this country of alpine and dwarf plants from the N.W. American states. Several of these did not come up to our expectations, partly due no doubt to the difference in growth owing to climate, but the majority have proved of value. Among these is the dwarf *Aquilegia scopulorum*. Four to six inches in height, the foliage is blue-grey and the flowers a pale mauve-blue, often with a touch of white within.

Found growing between stones and in volcanic scree, *Campanula lasiocarpa* is a native of alpine and sub-alpine zones of America; it is also found in Siberia and the islands north of Japan. The plant, of which the Japanese nurserymen were at one time offering a white form, is about 6 inches in height, and has erect deep blue bells of an inch or more in length.

The genus *Eriogonum* is a very large one, and has several very lovely members of which *E. ovalifolium* is one, but beware! Do not order any that are unknown to you because there are many worthless ones as there are bound to be in a genus of over a hundred species. But *E. ovalifolium* has silvery white foliage and heads of deep pink which pale with age (Fig. 88).

Of recent introduction from the dry sunny woods of Oregon, *Iris innominata* has already earned for itself the name of being a bad transplant. Without doubt it is, but it is a lovely species and has a wide range of shades from lavender to golden yellow. This last, which I think is the most attractive, has flowers on 9- or 10-inch stems. *Phlox adsurgens* is a native of shaded woodlands in southern Oregon and northern California, and was introduced about fifteen years ago. In colour it has a pink base with white in the centre and five deeper pink lines down the centres of the petals.

For a very long time, the only *Lewisia*s that were in this country were of the *Cotyledon* type; now there are several of different habit. One of these is *L. brachycalyx*, an inhabitant of the wet places in New Mexico, Arizona, Utah and S. California. From reports, it was in cultivation during the last century, but was lost until about 1933. The flowers are large, white with faint veining, and they sit close to the rosette. A remarkable plant in its ability to survive drought is *L. rediviva*, the State flower of Montana. It is native to the highlands of that State, of Colorado, British Columbia and California.

Deep pink in colour, the flowers are over 2 inches across, and the leaves, which have died down by flowering time, are thick and fleshy. In *L. Tweedyi* the leaves which measure over 6 inches in length are large and fleshy, and the flowers are borne on branched stems; they are an apricot shade and well over an inch in diameter.

Phlox mesaleuca—a wonderful introduction and one deserving all the attention it requires—comes from the Black Range, New Mexico, and has grey-green linear leaves and flowers of a pale pink, over $1\frac{1}{2}$ inches across on 6- to 9-inch stems.

A genus that has been brought to this country in great number during recent years is *Penstemon*, a large genus of very diverse forms and, I regret to say, confused nomenclature. The species, *P. coloradensis*, is one of the dwarfer ones from the State after which it is named. The leaves are blue-grey, about $\frac{1}{2}$ -inch in length, and the flowers, which are borne in raceme-like inflorescences, vary from lilac to pale purple.

Introduced about twenty years ago from the Drakensburg Mountains, *Rhodohypoxis Baurii* is a tiny plant of sharp-pointed leaves and deep rose-pink flowers; there is also a white form and numerous varieties, intermediate in shade.

Apart from the New Zealand shrubs that adorn our gardens, there are a number of the smaller plants from the alpine zones of great importance. *Celmisia* is a genus well worth attention; its members range from plants of tiny rosettes of $\frac{1}{4}$ -inch across, to rosettes with leaves well over a foot in length and stout flower stems. The species *C. bellidioides* (Fig. 89) is intermediate, a plant of an inch or two and made up of fleshy grassy-green leaves in rosettes and white flower heads on 3- to 4-inch stems; these flower heads are over $\frac{3}{4}$ -inch across. There are several species similar to *C. coriacea* and the naming is slightly confused in this country, but the plant usually grown under this name has stout stems of a foot or more, each bearing a solitary flower head, although stems with two or three heads are known. With a yellow centre, the rays are pure white and the foliage is thick and hard and covered with a silvery tomentum.

No less striking in its silvery covering is *Leucogenes grandiceps*, a New Zealand Edelweiss of 3 to 4 inches in height and flower heads surrounded by silvery bracts.

New Zealand, too, has its Gentians: these differ in structure from the plants usually accepted as such, and have whitish flowers sometimes veined with purple. Prostrate on the ground, *G. saxosa* is a native of the shores and is found within reach of the sea spray. The leaves, which are deep green and tinged with brown, are spoon-shaped, and it has saucer-shaped flowers about $\frac{3}{4}$ -inch across.

A noble plant, *Ranunculus Lyallii*, is a native of subalpine meadows in the southern Alps, where it is said to reach 4 feet in height. At home here, or at least at Edinburgh, it ranges from 2 to 3 feet in height, although occasionally there is a taller one. The flowers, which are pure white, are very large and the leaves are peltate.

With the New Zealand plants I have included two from Tasmania: the first, *Milligania densiflora*, is native to the Hartz Mountains, and is considered one of the finest of the herbaceous plants of that country. So far, all the plants that have flowered in this country have creamy-white flowers, but collectors state that pink-flowered forms are also found. Deep green in colour, the leaves are hard and rigid and the blooms are borne on dense racemes up to 18 inches in height.

Practically no success has been obtained with seed harvested at Edinburgh. The other Tasmanian plant included is *Prionotes cerinthoides*, an epiphytic climbing shrub of moist woods. There is said to be more than one form of it; one has reddish tubular flowers of over an inch and hard, deep green foliage.

Since the beginning of this century nurserymen have been importing alpine plants from Japan, and just previous to 1939 this had increased tremendously. One of the first plants to attract a lot of attention was *Astilbe simplicifolia*, and I trust members will excuse its inclusion here, but it is a plant that I have always admired and one that I think should be grown more than it is; too often are the taller hybrids grown. The flower stems are only a few inches in height, the flowers white or flushed pale pink, and they do not appear until late in the season.

Opposite to the last in flowering-time is *Glaucidium palmatum*, which comes into bloom in early spring almost before the leaves are developed; these blooms are pale pink and measure over 2 inches across. The plant has been grown in this country at different times, but has never become as wide-spread as it deserves. It is native to Hondo and Yezo.

Brought to this country just prior to 1914, but would appear to have died out for several years, is the plant known as *Pteridophyllum racemosum*. Well-named (the deep green leaves do resemble a Lomaria fern), it comes from Central Japan and is a woodlander growing in shade among moss in subalpine forests. The small flowers are white and are borne in racemes up to 9 inches in height. Described about 1928 and introduced a few years later, *Thalictrum Kiusianum* is a tiny Meadow Rue of 2 inches in height, bearing white flowers often tinged with purple.

When one hears of plants from Asia Minor, one usually thinks of Irises and other bulbous plants, but the flora of that vast area contains many different types of plant. One of them is *Chrysanthemum Catananche*, a native of the Great Atlas and brought back into our gardens by E. K. BALL. It has finely cut foliage and apricot coloured flower heads.

From the Sicilian Taurus the dainty *Iris Danfordiae* was first introduced before the end of the last century, and I am afraid repeated importations have been necessary to keep it in cultivation. A bulbous species, it blooms in early spring, carrying the deep golden flowers on 5- or 6-inch stems. In the north we lack the hot sun it seems to require. Very different in habit is *I. Bucharica*, a native of the Eastern slopes of the mountains of Bokhara, which has leafy stems up to 18 inches in height and bearing several blooms at the tips.

Most plants from these regions dislike winter damp and this plant, *Omphalodes Luciliae*, is no exception. In a few gardens I believe it is at home and seeds itself, but at Edinburgh it requires protection. The flowers are pale forget-me-not blue and the leaves are glaucous blue.

We are also indebted to E. K. BALL for sending home, in 1934, *Orphanidesia gaultherioides*. First found about eighty years ago, it is native to the south-east corner near the Black Sea, where it grows with *Rhododendron ponticum*. The foliage resembles that of *Epigaea asiatica*, but the blooms, which are about 1½-inch in diameter, are widely saucer-shaped and of a deep pink. It is too early to say much of its behaviour out-of-doors at Edinburgh; the plant photographed was growing under glass.

Since the beginning of this century, great plant collections have been brought home from China, Burma, south-eastern Tibet and India. One of the early arrivals was *Gentiana hexaphylla*, first sent home by FARRER in 1914 from Kansu, and although its first discovery dates back to the last century, this would appear to be its first time in cultivation. It is a close growing species of the subsection *Ornatae*, coming into bloom in summer and bearing pale blue sub-erect trumpets. These collections were responsible for bringing into cultivation a genus almost unknown, that of *Nomocharis*, and one of the first to be sent home was *N. pardanthina*. It was collected on the Lichiang Range by FORREST about 1910.

A vast number of *Primula* species were collected by FORREST, and space only permits the mention of one or two distinct types. The first—*P. Forrestii*—was found on the eastern flank of the Lichiang Range, growing in crevices of dry limestone cliffs. It has a woody stem and deep golden-yellow flowers. Another distinct species is *P. nutans*, a sweet scented species with pale mauve flowers in compact heads and covered with whitish meal. Perhaps the most unusual species is *P. Vialii*, often called the 'Red Hot Poker' *Primula*; it is a close spike and when the flowers are in bud the calyxes show red and the opened flowers a pale mauve. For many years this was thought to be a distinct species from *P. Vialii*, and was called *P. Littoniana*.

A native of Mount Victoria in Burma, *Anemone obtusiloba patula* was introduced about 1913. It is a semi-prostrate grower with flowering stems radiating from a central rosette bearing deep purple and blue flowers of $\frac{3}{4}$ -inch across (Fig. 90). Seed of the variety has proved difficult to germinate.

Collected by WALTON at Lhasa, and subsequently by WARD in 1924 and SHERRIFF in 1939, *Codonopsis mollis* (Fig. 91) has proved too difficult for some gardens, and Edinburgh is one of them. An attractive plant (it has not the objectionable smell of many of its relatives), it has pale blue tubular flowers and greyish-green foliage.

In the same region WARD collected *Cyananthus Wardii*, another plant which seems to have disliked cultivation; of spreading habit, the leaves were covered with silvery hairs and the blooms about an inch in length. It is a very difficult plant to keep.

There are many *Gentians* from this area and one sent home by SHERRIFF—*G. amoena major* (Fig. 92)—looks as though it might settle down. It forms a cushion of the abruptly pointed leaves and produced within this cushion, trumpet flowers of over 2 inches in length, pale blue on the folds and with purple on the outside of the petals. *G. gilvostrata*, collected by WARD in Upper Burma in the region of the Tibetan frontier, was found on gravel patches on slopes facing south. Forming lax rosettes of greyish-green leaves, the flowers, which measure about $1\frac{1}{2}$ inches in length, are pale blue with mauve bands down the outsides of the corollas.

Described by its collector as one of the finest of the genus, *Omphalogramma Farreri* (Figs. 93 and 94) was introduced from Upper Burma in 1919, and was in cultivation at Edinburgh for many years. Rosy-purple in colour, the large fringed flowers were produced before the leaves were fully developed.

Much has been written about *Primula sonchifolia* since its introduction from Burma in 1929, and it will suffice for me to say that it is worth any attention that it may require. While it is a common plant in Kashmir, *Campanula cashmiriana* is not always happy in

gardens. One of a closely allied group, it has silvery-grey foliage and 1-inch bells of pale blue.

A species of Gentian which has been repeatedly sent home is *Gentiana Waltonii*, one of the Aptera section. From a central rosette of deep green strap-shaped leaves, there are many decumbent stems of purplish-blue flowers.

The following are included more because they are new plants than because they are difficult, as in one or two cases little is known of their behaviour in other parts of the country.

Primula aureata, "just arrived" at Edinburgh; in a pan of Swertia seed which had been received from Darjeeling, a greyish leaved seedling was noted. This was grown on as it looked like the more common *P. Edgeworthii*, and much surprise was caused when it produced yellow flowers (see Fig. 95).

First found by WARD in the Assam Hills in 1935 and later sent home as plants by SHERRIFF from East Bhutan, *Primula bhutanica* has pale blue-mauve flowers and leaves covered with white meal. Also sent home by SHERRIFF was *Primula bracteosa*, another of the Petiolares section. The leaves are covered with meal and the flowers pale pink. An ally of these is *Primula gracilipes*, but this species has green leaves and deeper pink flowers. In the earlier days of its introduction it was distributed as *Primula Boothii*.

Introduced by SHERRIFF in 1938, *Saxifraga umbellulata* forms small, perfectly shaped rosettes of spoon-shaped leaves, from the centres of which arise 6-inch stems bearing many deep yellow flowers.

(The lecture was illustrated with a number of slides; all the photographs from which these slides were made, with the exception of three, were taken at the Royal Botanic Garden, Edinburgh.)

EMBOTHRIUM COCCINEUM.

By WILFRID FOX, M.D.

WITH regard to Commander GILLILAND's query in the September number of the R.H.S. JOURNAL, p. 256, about the exact locality or altitude in Chile, where *Embothrium coccineum* occurs in nature, I have seen it growing as a common shrub on the shores of the Ultima Esperanza Creek and some little way inland to the altitude, say, of 500 or 600 ft. above sea level. This is just north of the Magellan Straits on the Pacific side, between latitudes 51 and 52 South, or roughly corresponding to that of Liverpool North. It grows there as rather a scraggy shrub up to 6 or 8 ft. high and was in flower when I was there in January, but probably past its best. It bore no comparison with the large and beautiful trees that one sees in Cornwall, particularly in the neighbourhood of St. Austell. It is not so common at the eastern or Atlantic end of the Straits, but this is not surprising, as the rainfall there is only 14 inches.

I know from a keen gardener who lives in Punta Arenas, which is on the Atlantic side, that the shrub grows on the Island of Tierra del Fuego, immediately south of the Straits, but I have not myself seen it there. He, however, sent me seeds gathered there and the resulting plants are absolutely bone hardy. In the past, having been thoroughly disheartened by repeated fatalities when attempting to grow

E. coccineum, I gave these seeds to the late LIONEL DE ROTHSCHILD, and under HANGER's skilful care they germinated well, and later he returned me three plants which have stood the five winters of the War, four of which were definitely severe in Surrey. They showed no damage at all, although we registered 30 degrees of frost on two or three occasions, and they were quite unprotected. How far north this plant grows I do not know, but I did not see it in the neighbourhood of Port Montt and the Lakes of Llanquihue and Todos los Santos, nor on the Pass which crosses the Andes in this neighbourhood at the level of 3000 ft. over to the Argentine side ; nor was there any visible on the lakes of Las Frias and Nahuel Huapi, that is to say about latitude 42 South.

I came across neither forms of *E. longifolium*, both of which I have tried, and was unfortunate in losing all the Rostrevor variety and occasionally some of the Comber type, although eight plants of the latter withstood last winter, when we endured 28 degrees of frost ; nor were they very much affected by the spring frost in April, which is usually more deadly, as these plants start their rather sappy growth early.

On the way down by steamer from Port Montt to the Straits of Magellan one passes through narrow channels which are called the English Narrows, as they were charted at the time of DARWIN's visit 100 years ago. There was no evidence of these shrubs as far as one could see from the steamer. The hills on each side were thickly clothed with 'Cogue' or *Nothofagus Dombeyi*, amongst which the silver under-leaf of *Drimys Winteri* was conspicuous.

I landed on the island of Chiloe, which is about latitude 43, and also on another island further south, which was entirely covered with *Philesia buxifolia*, but on neither of these did I see any *Embothrium*. It rather looks, therefore, that the hardiness of the *coccineum* form depends a great deal on where the seed is gathered. If it comes from far south the resulting plants are the hardiest of the three varieties of *Embothrium*. Next comes the Comber form of *longifolium*, with the Rostrevor form the most tender.

LILIES.

By R. W. WALLACE, V.M.H.

(Lecture given on July 3, 1945; Colonel F. C. Stern in the Chair.)

WHEN our Chairman, who himself is no mean cultivator of Lilies, says that I am to tell *you* how to resuscitate the growing of Lilies in your gardens, he has set me a very difficult task. My audience may comprise many past cultivators and many present war-time cultivators, and many would-be cultivators, therefore my remarks really are not to those who have experienced so many pleasures, trials and difficulties and overcome them, but to those who may be inclined to embark on the cultivation of this most interesting family for the first time.

I think it would be as well if they were to try and cultivate those that have existed in our gardens here and there for a long time, I cannot say for how long, but *Lilium candidum* was in existence 3,000 years B.C. and is still with us; that gives you some idea of the strength and virility of that species. You all know that if by chance fate lets you grow *L. candidum* successfully in your garden, you could want nothing better.

Let us look at Europe and see what it can give us in the way of Lilies and consider those Lilies; because they are European they have a climate very close to ours, and we have a very good chance of satisfactory cultivation.

We will just run through Europe west to east. In the Pyrenees we find *L. pyrenaicum*, a strong robust Lily, not everybody's fancy. In the summer of 1944, in the far North, miles away from civilization, Major PAM came across a wonderful clump of this Lily some 4-5 ft. high, very robust growing, in coarse herbage and vegetation. This shows how well it grows when undisturbed. I would just like to remark here that in WILSON's great book on Chinese Lilies, he says "The lilies are found growing in the waste places of the world." If they did not inhabit those waste places of the world they would not be in existence to-day, because where cultivation comes it tends to destroy the natural vegetation, and the Lily disappears.

Next we come to the European *L. Martagon*, the ordinary purple and its white form, and then from the Italian Alps the little scarlet *L. pomponium*, the small scarlet Turks' Cap, and also the Italian *L. candidum*. Then we pass into Greece, to the great Lily of Constantinople, *Lilium chalcedonicum*, a very fine Lily. Now we travel farther east to the Caucasus, where we have *Lilium Szovitsianum*, one of the most noble Lilies, that likes to remain undisturbed when once established. These four or five are species of fairly easy growth. I suppose you all know the Lily as a rule likes shelter at its roots; those I have mentioned just now are happy inhabitants of the herbaceous border where they can be grown easily and naturally. But I have forgotten one group of hybrids, the *umbellatum* group, those that have upright cup-shaped flowers looking you in the face. They have all been derived from a species called *L. dauricum* and are most amenable to cultivation.

There is one Lily which belongs to the past which has a great history and is fairly easily cultivated, that is *Lilium testaceum*. It has lovely creamy-buff flowers and is a hybrid between *L. candidum* and

L. chalcidonicum, the two Lilies I have mentioned. It is very easily grown, and having a lot of the *L. candidum* blood in it, however badly it may do with you, you never really lose the bulbs.

I want to go a little farther back ; those particular species I have mentioned, the European species, have been in existence as far as man knows (other than *L. testaceum*, the hybrid) for a thousand years or more, and in nature they are only found in scattered places here and there, being the types still in existence. Does not that prove that they are fairly easy of cultivation, because you can find them in nursery gardens and other gardens from time to time growing with extreme freedom and floriferousness, and very happy indeed. If they were not subject to cultivation we should not have them as we do to-day, so they are really Lilies you may try first, with a good hope of success.

I do not think we need talk about cultivation. I think you all know, or ninety per cent. of you do, that Lilies like their faces in the sun and their toes in the shade so to speak, and plenty of drainage, a light, free soil that the water can go into and get away from very quickly. Remember always that most of them have two sets of roots, those that come from the stem and those that come from the base of the bulb, and therefore a little feeding to help them on the top of the surface and around the stem is beneficial to their well-being.

I have forgotten to mention *Lilium croceum*, the old cottage garden Lily, the orange Lily of Northern Ireland ; you still find them wild in the Swiss Alps here and there. It is a very good, strong, hardy Lily and does better in a cottage garden than almost anywhere.

Now we will go a little farther afield and come to the Chinese Lilies. As you know, Japan is always said to have been the home of the Lilies, but as a matter of fact Japan has a far smaller number of species growing wild there than has China. It is curious the way Japan has in the past claimed credit for everything, but the quiet Chinaman has been the mainstay of the whole thing. Owing to the work of HENRY, WILSON, FARRER and the other great explorers of China, we have been able to get into our gardens a vast number of new species.

Among the Chinese species, those that you can depend upon are *Lilium Davidi*, which was introduced over 35 years ago by the late GEORGE FORREST, collected for Mr. BULLEY under the name of *L. pseudotigrinum*, or *L. Maximowiczii*. It is the parent and mainspring of one of the finest hybrid garden Lilies we have, namely 'Maxwill' ; it is a cross between Maximowiczii and Willmottiae. *Lilium Davidi* is a Lily with a wonderful constitution and lasting year after year. I had a great friend, a schoolmaster in Durham, many years ago, and when that Lily was first introduced he bought three bulbs, and grew them in his Durham garden, and brought them down to Tunbridge Wells many years ago. I am sorry to say they are not in his garden now because the soldiers have been there, but just before his death he had Lilies grown on from these original three bulbs. I have known other gardens where the typical *L. Davidi* was planted and found ten years later in great clumps. That crossed with *L. Willmottiae* has given a Lily called 'Davimottiae,' which is one of the finest hardy Lilies we have. When you have an opportunity, get 'Davimottiae,' and you will be sure of having a really good Lily. The true *L. Davidi* is not so plentiful as it was.

There is one Lily of Japanese origin, the old Tiger Lily, that you all know ; it flowers in August with orange-red flowers and black spots,

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

JULY 8, 1945.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and fifteen other members present.

Awards Recommended.

Silver-gilt Flora Medal.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Lilies, Kniphofias and other hardy flowers.

Silver Flora Medal.

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of Lilies, Alstroemerias and other hardy flowers.

Silver Banksian Medal.

To Mr. K. W. Harle, Lower Basildon, Berks., for an exhibit of succulents.

Flora Medal.

To Orchard Neville Nurseries, Baltonsborough, Somerset, for an exhibit of rock garden plants.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of hardy shrubs.

Banksian Medal.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of hardy shrubs.

Award of Merit.

To *Alstroemeria violacea* as a flowering plant for the cool greenhouse (votes unanimous; subject to verification of name), from Colonel S. R. Clarke, C.B., Borde Hill, Haywards Heath.

To *Deutzia setchuenensis* var. *corymbiflora* as a hardy flowering shrub (votes unanimous), from W. Bentley, Esq., Quarry Wood, Newbury. See p. 206.

To *Lilium aurelianense* (*L. Sargentiae* × *L. Henryi*) as a hardy flowering plant (votes 14 for, 0 against), from Messrs. W. A. Constable, Ltd., Southborough. See p. 207.

To *Lilium* 'Coronation' (*L. Davidii* var. *Willmottiae* × *L. dauricum* seedling) as a hardy flowering plant (votes unanimous), from W. Bentley, Esq., Quarry Wood, Newbury. See p. 207.

To *Nymphaea* 'Sunrise' as a hardy aquatic flowering plant (votes unanimous), from Major E. de Rothschild, Exbury, Southampton. See p. 207.

Preliminary Commendation.

To *Stewartia koreana* as a hardy flowering shrub (votes unanimous), from Major E. de Rothschild, Exbury, Southampton.

Other Exhibits.

Carrierea calycina, exhibited by Col. S. R. Clarke, C.B., Borde Hill, Haywards Heath.

Magnolia macrophylla, *Rhododendron* 'Marita' (*R. prunifolium* × *R. viscosum*), exhibited by Major E. de Rothschild, Exbury.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended :

Silver Flora Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

First-class Certificate.

To *Cypripedium niveum* var. 'Goliath' (votes 8 for, 0 against), from Sir William Cooke, Bt., Wyld Court, Hampstead-Norris, Berks. See p. 206.

Award of Merit.

To *Laeliocattleya* × 'Babylon' Westonbirt var. (*Lc.* 'Ishtar' × *Lc.* 'Sargon') (votes 7 for, 0 against), from Messrs. H. G. Alexander, Ltd., Tetbury, Glos. See p. 206.

1 PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

To *Odontoglossum* x 'Asca' var. 'Argus' ('Ascania' x *hellenense*) (votes 7 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath. See p. 207.

Cultural Commendation.

To Messrs. Stuart Low & Co., Jarvis Brook, for a vigorous specimen of *Arachmanthe Lowii*, with a pendulous spike more than eight feet in length and bearing thirty-two flowers, three of which, at the basal end, differed in form and colour from the others. The species was discovered in Sarawak by Sir Hugh Low, in 1845, and received a First-class Certificate in 1896.

Other Exhibits included *Cypripedium* 'Albion' and *Cypripedium* 'Clair de Lune,' from Frank M. Wyatt, Esq., Tilgate Horticultural Station, Crawley, Sussex.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. T. Hay, V.M.H., in the Chair, and seven other members present.

Awards Recommended :

Award of Merit.

To 'Rose Frills,' as an exhibition Picotee variety (votes 6 for, 0 against), raised and shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex. See p. 206.

To 'E. M. Wilkinson,' as an exhibition Picotee variety (votes 6 for, 0 against), shown by W. G. Ferris, Esq., Woodhurst, High Warren, East Horsley, Surrey. See p. 206.

To 'Evelyn Knapton,' as an exhibition variety (votes 7 for, 0 against), shown by H. A. Knapton, Esq., Wistaria, Bognor Regis, Sussex. See p. 206.

Selected for trial at Wisley.

'Rose Frills,' shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

'E. M. Wilkinson,' shown by W. G. Ferris, Esq., East Horsley, Surrey.

'Southern Breeze,' shown by F. J. Hayward, Esq., 43 Mill Road, Maldon, Essex.

'Evelyn Knapton' and Seedling No. 10, shown by H. A. Knapton, Esq., Bognor Regis.

'Allwoodii Monty,' 'Garden Pink Dusky,' shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

Other Exhibits.

'Jean Milton' (A.M. 1944), shown by W. G. Ferris, Esq., East Horsley, Surrey.

'Southern Mist,' shown by F. J. Hayward, Esq., Maldon, Essex.

JOINT SWEET PEA COMMITTEE.—Mr. G. W. LEAK, V.M.H., in the Chair, and nine other members present.

Awards Recommended :

Preliminary Commendation and Selected for trial at Wisley.

Seedlings Nos. 60, 102, 125, 150, 200, 365, 465, 467, 469, 496, 530, 571A, and 725, all shown by Messrs. R. Bolton and Son, Birdbrook, Essex.

Other Exhibits.

'Peggy Edwards,' 'Maureen,' 'Ida' and 'Purple Mountain,' shown by H. P. Edwards, Esq., Old Hall Farm, Overton Bridge, Wrexham.

Seedlings Nos. 4 and 5, shown by J. A. Hiron, Esq., Greenland Cottage, Bloxham.

'R.A.F.' and 'Amethyst Beauty,' shown by Wing Commander J. C. P. M. Davis, Blair Atholl, Radlett, Herts.

'Mae,' 'Connie,' and 'Leander Pink,' shown by J. H. Taylor, Esq., 42 Windsor Road, Cambridge.

'Red Army,' 'Peggy' and 'Margaret Thomson,' shown by W. G. Thomson, Esq., 26 The Midway, Buckhurst Hill, Essex.

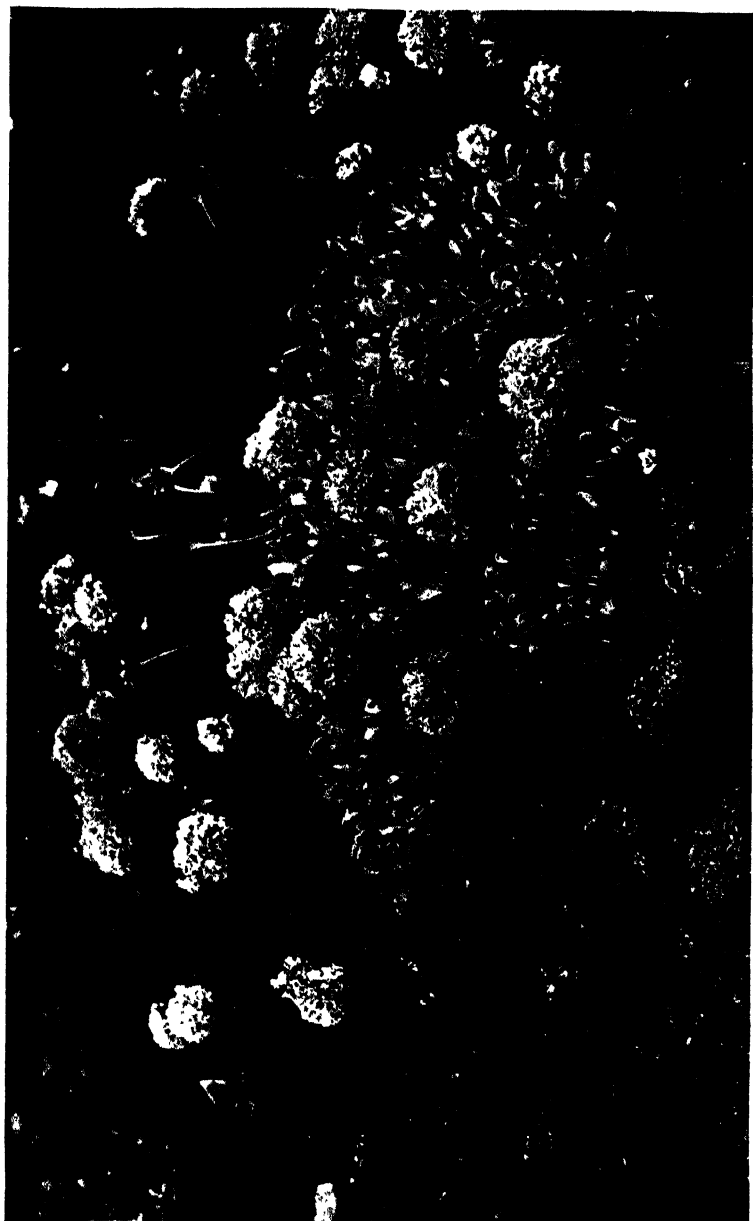
'Phyllis,' 'Carol,' 'Mrs. D. Gourlay Thomas,' 'Trixie,' 'Valiant,' 'Eclipse,' and Seedling 94, shown by Rev. D. Gourlay Thomas, 31 Thornton Hill, Exeter.

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and five other members present.

Awards Recommended :

Selected for trial at Wisley.

'Rosetta,' shown by Messrs. Blackmore and Langdon, Bath.



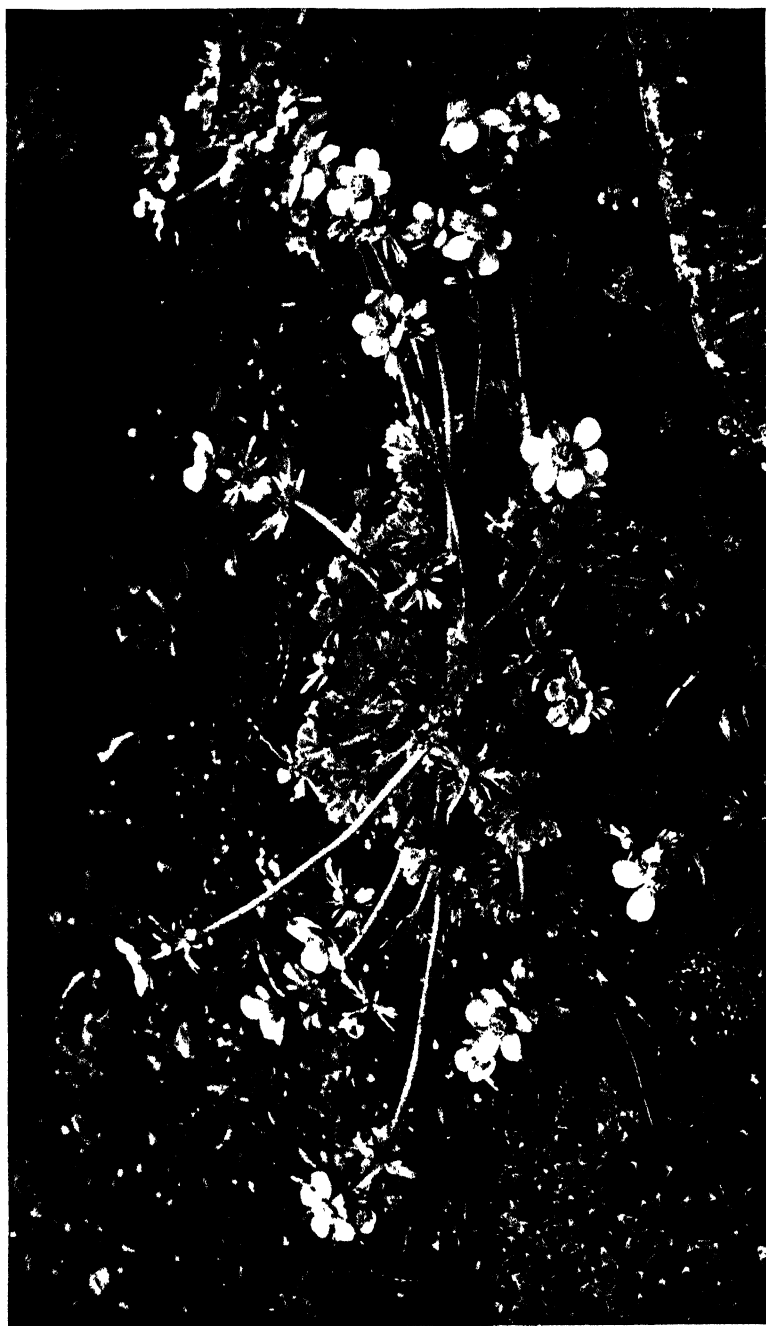
Photo, D. Wilkie]

FIG. 88.—*ERIOGYNUM OVALIFOLIUM*
(See p. 285)



FIG. 89. CLIMINIA BULBIPLOIDES
(See p. 280.)

Photo, D. Wilkie.



Photo, D. Wulke]

FIG 90 — ANEMONE OBTUSILOBA PATULA
(See p 288)



Photo D. Wilke

FIG. 91. CODONOPUS MOLLUS
(See p. 288.)



FIG. 92 - GENTIANA AMOENA VAR. MAJOR
(See p. 288.)

Photo D. Wilkie]



Photo, D. Wikkie

FIG 93 — OMPHALOGRAMMA FARRERI

(See p. 288.)

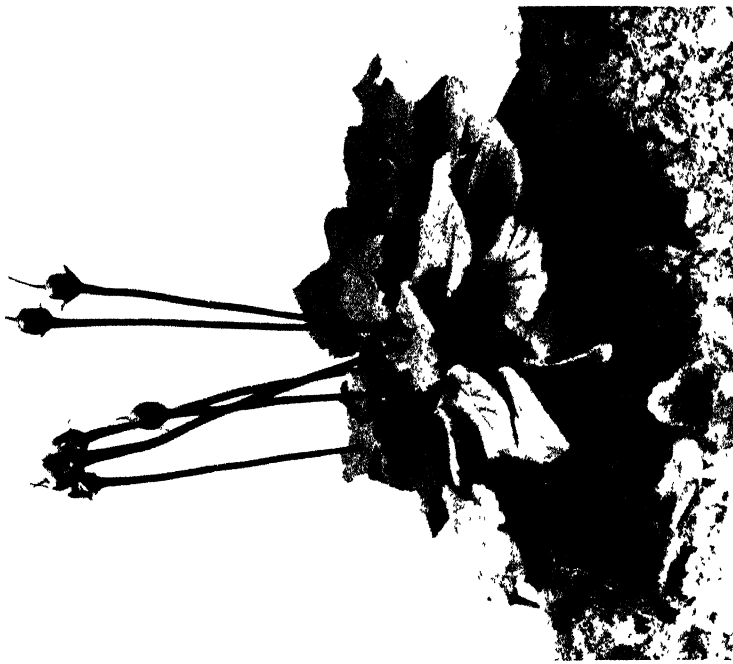


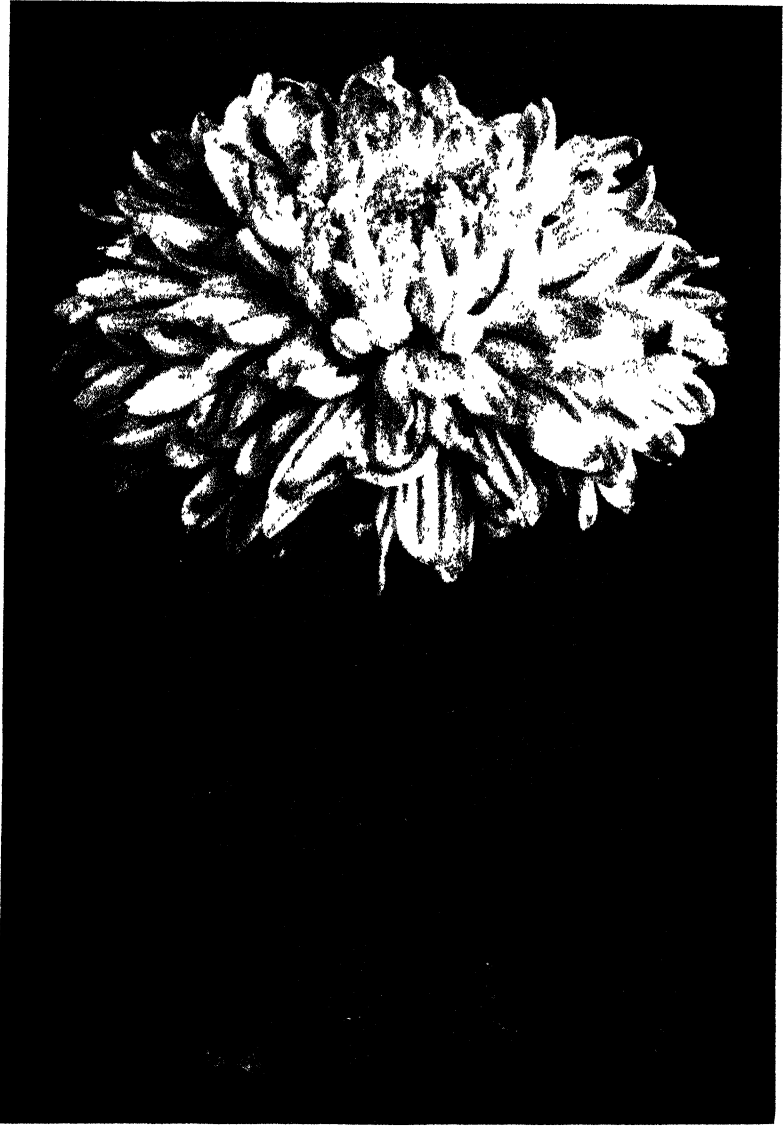
Photo D. Wikkie

FIG 94 — OMPHALOGRAMMA FARRERI, THE SAME PLANT IN FRUIT SHOWING FULLY DEVELOPED FOLIAGE. (See p. 288.)



Photo, D. W. H. H. H.

FIG. 95 - PRIMULA AUREATA
(See p. 289)



Photo, W. Abbing.

FIG. 96. CHRYSANTHEMUM 'CRESSINGTON',
AN EARLY-FLOWERING EXHIBITION VARIETY.
(See p. 296.)

Other Exhibits.

'King George,' shown by Suffolk Seed Stores, Woodbridge, Suffolk.
 'White Ladies,' shown by Messrs. Stark and Son, Ltd., Fakenham, Norfolk.
 The Awards to the Delphiniums in the Wisley Trials were confirmed.

JULY 24, 1945.

CLAY CHALLENGE CUP COMPETITION.

No Rose was entered for the competition.

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and ten other members present.

Fasciated Chrysanthemum maximum.—The fasciation of the Chrysanthemum sent to the last meeting, its sender reported, had occurred in at least the two previous years.

Potentilla.—The Potentilla shown from Mr. Bentley's garden at the last meeting had been examined by Mr. A. B. Jackson, who considered it to be a small white-flowered form of *P. fruticosa*.

Bulbs of Leucojum pierced by a stolon.—Dr. Tincker showed bulbs of *Leucojum autumnale*, found at Wisley by Mr. Wall, pierced by the stolon of *Agrostis nigra stolonifera*, in a fashion similar to that frequently caused by the stolons of *Agropyrum*.

Leek Moth.—Mr. G. F. Wilson reported that an attack of the Leek Moth had been discovered at Aldeburgh, Suffolk. As previously reported this continental insect had recently become established within 15 miles of the coast from the Isle of Wight to Deal. The new infestation appeared to be the result of a separate invasion of this undesirable alien from the continent where it occurs in Belgium and France.

Variation in Ballota nigra.—Mr. G. W. Robinson showed varieties of *Ballota nigra* from the University Botanic Garden, Oxford, with white flowers and pale foliage, with speckled mottling of the foliage with purple and with white flowers, and with more or less blotched variegation. The scent was marked in all forms.

Tomato seedling with enlarged cotyledons.—Mr. John Parkin of Blaithewaite, Wigton, sent a Tomato seedling, one of a batch of seedlings raised at the end of February, which had no plumule. It was potted on with the normal seedlings and has remained alive until now, developing a fair root system. The hypocotyl swelled considerably and the cotyledons, now about 2½ inches long, had become somewhat leathery, fleshy and twisted, "perhaps," as Mr. Parkin suggested, "due to the assimilable food from the cotyledons being utilized in these ways, because not liable to be drawn off by a meristem."

Variation in foliage of Sterculia.—Miss Phinn of Enfield Wash sent leaves of *Sterculia diversifolia* which she had raised from seed in her garden, showing considerable differences between individuals, for comparison with leaves of *Sterculia alata irregularis*, shown at a previous meeting, from India.

Diseased Gladiolus.—Diseased Gladioli received from R. Gore, Esq., of Woodhill, Virginia Water, were referred to Mr. Green for examination.

Bulbous Leeks.—Lt.-Col. Hammond-Davies of Shiplake, sent bulbs of Leek which he had found on plants standing in the seed-rows from March 1944 to March 1945, and then planted out. Several had produced bulbs about 2 inches through, but a few had run to seed. Similar bulbs had previously been before the Committee.

Variations in Plantago.—Mr. Bowles showed spikes of *Plantago major* 21 inches long, exclusive of the peduncle, from Mr. Trotter's garden at Leith Vale, and from his own garden the interesting Rose Plantain, known from Parkin's time, in which the bracts are large, well-developed, roundish leaves; spikes from Mr. Palmer's garden of *P. major* with foliaceous bracts at the base of the spike; and of *P. media* from his own garden showing the same phenomenon; and also from his own garden foliage of the purple-leaved plantain.

FRUIT AND VEGETABLE COMMITTEE.—Mr. A. CHEAL in the Chair, and twenty-two other members present.

Award Recommended:—**Gold Medal.**

To the Governors of St. Andrew's Hospital, Northampton, for collection of Potatoes (20 for, 0 against).

iii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and ten other members present.

Awards Recommended :—

Silver-gilt Lindley Medal.

To Capt. B. H. B. Symons-Jeune, Old Windsor, for an exhibit of Phloxes.

Silver-gilt Banksian Medal.

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of herbaceous plants.

Silver Flora Medal.

To Messrs. Frank Cant & Co., Ltd., Colchester, for an exhibit of Roses.

To Mr. Amos Perry, Enfield, for an exhibit of herbaceous plants.

Silver Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of Phloxes and other herbaceous plants.

Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Phloxes.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

To Mr. F. W. Goodfellow, Aldridge, for an exhibit of Border Carnations.

To Mr. E. Ladhams, Elstead, for an exhibit of alpines and herbaceous plants.

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of herbaceous plants.

Banksian Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of *Dianthus Allwoodii* and garden Pinks.

To Mr. W. E. B. Archer & Daughter, Ltd., Sellindge, for an exhibit of Roses.

To Messrs. A. A. Buckwell & Sons, St. Mary Cray, for an exhibit of Roses.

To Messrs. B. R. Cant & Sons, Colchester, for an exhibit of Roses.

To Mr. R. D. Lainson, Piltdown, for an exhibit of Gazanias.

Preliminary Commendation.

To Nicotiana Hybrids, from Messrs. Watkins & Simpson, Ltd., London, W.C. 2.

To Nicotiana 'Hybrid White,' from Messrs. Watkins & Simpson, Ltd., London, W.C. 2.

Selected for trial at Wisley.

Fuchsia 'General Wavell,' from C. J. Howlett, Esq., Earley, Reading.

Gladiolus 'Blau Schoneit,' seedling No. 1, from Mrs. H. W. Hall, Downton Fields, Hordle, Lymington, Hants.

Gladiolus P/TC No. 1, from Mrs. H. W. Hall, Downton Fields, Hordle, Lymington, Hants.

Gladiolus 'Red Lary' × 'Hinemoa' seedling No. 1, bright red, from Mrs. H. W. Hall, Downton Fields, Hordle, Lymington, Hants.

Gladiolus 'Top of the Milk,' from Mrs. H. W. Hall, Downton, Fields, Hordle, Lymington, Hants.

Nicotiana Hybrids, from Messrs. Watkins & Simpson, Ltd., London, W.C. 2.

Nicotiana 'Hybrid White,' from Messrs. Watkins & Simpson, Ltd., London, W.C. 2.

Other Exhibits.

Fuchsia 'Lord Lonsdale,' from C. J. Howlett, Esq., Earley, Reading.

Pelargoniums, from Mrs. D. R. Moore, Farnborough, Kent.

Solidago 'Leveret,' from H. Walkden, Esq., Sale.

Sweet Peas 'Margaret Wagstaffe' and 'Mrs. Barbara Elliot,' from G. H. Garside, Esq., Abbey Park, Leicester.

and has little tiny bulbils in the axils of the leaves. It has been known from time immemorial, and has been cultivated in the past in very large numbers. One more Japanese Lily is *Lilium Hansonii*, the Japanese Martagon Lily. It has a curious shaped flower, the petals only half reflex, very thick, and orange with black spots. The great thing about *L. Hansonii* is that I have never known the bulb diseased and I have never known the bulb disappear, and that is saying a great deal for Lily bulbs. If you look after *L. Hansonii* you will always have it in your garden, although it may be injured by the frost in the spring.

That leads me on to another point that is rather interesting: *L. Hansonii*, the so-called Japanese Martagon, is so interested in the members of its own family that it has reached out a very long hand all the way to Europe and embraced the European *L. Martagon*, and by cross fertilization has given us a wonderful race of hybrids. It has crossed with the white Martagon, the ordinary Martagon and *L. M. var. dalmaticum*. I believe Mr. ROSE has these Martagons growing in the utmost luxuriance in the garden at Townhill. That is an alliance between Japan and Europe; it is not an alliance in the ordinary sense of the word, but it is rather interesting that these two Martagon Lilies so far apart geographically should have so readily crossed and produced children of such great beauty.

Before I leave China, *L. Willmottiae* was called after the late Miss WILLMOTT, a great cultivator of every type of bulb. She particularly liked two Lilies, one the white Martagon of which she had most glorious clumps, and the other, a most difficult Lily to grow, what we used to call *L. Kramerii*, a pink trumpet Lily. She used to have a wonderful group growing on the top of the rock garden which she alleged had been there for years, but in those days there were frequent importations from abroad; I remember she told me how that clump went on year after year.

There is one other Japanese Lily I am going to tell you about, a lovely pink Lily called *rubellum*. It is easily raised from seed; it grew well in Mr. RAFFIL'S garden and also at Wisley where they had the most delightful clumps. It was my privilege to be the first to flower this Lily over fifty years ago; it was an innovation, a new pink Lily, a most delightful Campanula-flowered Lily.

Now I come to the Lily you must all know, it should be No. 1 on your list, WILSON'S *Lilium regale*. To those of you who have read his book and that fascinating picture where he describes the finding of the Lily, how he travelled 2,000 miles up the Yangtse River and another 250 miles up its tributary, the river Mim, and there on the rocky hillsides on the slopes of the mountains was the Lily literally in tens of thousands in full flower. The Lily was in great profusion in its own habitat, and I have never heard of any other Lily being so plentiful in the wild. It is a very curious thing that we have found in this country that the one Lily that will produce itself readily and freely from seed is *L. regale*, which relates back to the fact that in its own country it is freely produced from seed; it is the most glorious Lily you could possibly grow. That is why, when WILSON introduced this Lily many years ago, the cultivation of Lilies became so popular.

I would just like to take you for a few moments to another part of the world. You all know the white trumpet Lily, *Lilium longiflorum*, that has been so debased in this country by being used for funerals and weddings; it is a glorious Lily, one of the most beautiful Lilies

that ever existed ; it comes from Japan. In the Philippine Islands we find another form called *L. philippinense* ; in the island of Formosa we find yet another form, *Lilium formosanum*. These three forms, one found in Japan, another in Formosa and the third in the Philippines, all representing one particular section of the Lily family, are all very similar. Somebody will correct me if I am wrong, but all these particular parts of the globe must have been connected by earth at some time, and therefore the Lilies were growing more or less together.

In Nilgheri, in Southern India, we find *Lilium neilgherrense*, a beautiful creamy coloured trumpet Lily, very rare in cultivation and very rare as a wild plant now, although the Curator of the Botanic Gardens at Ootacamund tells me he does know it exists here and there.

A bit farther north we come to *L. sulphureum*, a gigantic trumpet Lily with glorious flowers, pale creamy yellow, a most perfect flower.

Farther on in China there is *L. Sargentiae*, a WILSON discovery and another trumpet Lily ; another wonderful Lily FARRER found growing in a monastery garden, which Col. STERN grew most magnificently in his garden at Highdown, was *Lilium centifolium*. There is yet another trumpet Lily in China, *L. japonicum* var. *colchesteri*. Those I have mentioned are the only Lilies of that nature in the world, and it is rather nice to trace their affinity one with the other.

We will pass over to the American Continent, where we find a race of Lilies different in character in nearly every point from the European, Chinese, and Japanese. They are nearly all growing down on the Pacific coast, from north to south you find them. You can easily embark on *L. pardalinum*, it is a very easy garden Lily grown under suitable conditions in fairly moist ground ; it does not like a hot, dry corner. If you have a fairly well-drained, moist portion of the garden *L. pardalinum* should do well ; it increases very fast, which is a very useful thing.

There are a good many other Lilies along the Pacific coast, some of very different types, not too easy of cultivation, otherwise we should see more of them here than we do to-day. There is one yellow Lily, *Lilium Parryi*, a beautiful yellow and with a delightful scent. It has been crossed again and again with forms of *L. pardalinum* and produced very good hybrids indeed. I believe I am right when I say that there are only two real yellow Lilies, *L. Parryi* in California, and *L. monodelphum* or *L. Szovitsianum* in the Caucasus. It is curious that this yellow colour is so rare and that we get more orange and red shades everywhere. These North American Lilies are mostly orange with reddish shades and black spots, except one or two smaller species, *L. Kelloggi* and *L. Bolanderi*, but they are not too easy.

I should mention two other North American Lilies which grow more on the east than on the west coast, they are *L. superbum* and *L. canadense*, both very lovely Lilies. *L. canadense* has been beautifully grown at Wisley for years, and there are some lovely illustrations in the Lily Year Books. It likes moisture, and in its own country it grows in moist meadows ; I saw a picture of it the other day growing in a field in America in the spring, acres and acres of it. The other, *L. superbum*, is a Lily which I rank high when it is properly placed in the garden, and it will go on year after year. I can see in my mind now in Northumberland a clump planted twenty years ago when twelve or eighteen bulbs were put in. Last summer we started to count the flowering stems, and we stopped at 70 ; they were six or eight feet high and one mass of flowers. Under happy conditions suited to it, it is

one of the finest Lilies I know, and is to be relied on to go on year after year.

There is another Lily I think I should mention because it is so different from every other, *Lilium giganteum* from the Himalayas. It is a very lovely flower and a handsome plant, but needs woodland conditions and vegetable soil. You dig a hole three feet deep and fill it with all the old vegetable matter you can find before you put the bulb in with the nose just above the ground ; when it flowers and breaks up it makes small offsets. It is a wonderful sight to see this gigantic Lily ten or twelve feet high with enormous rhubarb-like leaves and long tubular flowers streaked with purple externally, with its delightful scent in the evening ; you may have to wait four or five years before it flowers, but if you succeed in growing this Lily you will think it well worth waiting for.

I do not think I need say much more, but I would like to say this : if you embark on the cultivation of the Lily you will have your disappointments, and you will have your pleasures, and when you go round your garden in the cool of the evening and come across some of your favourites in full beauty they will compensate you for all the trials and difficulties you have been through and for all the disappointments you have had.

Now there are some people who are very clever cultivators ; I could mention half a dozen, but "no names no pack drill," still I know they do grow their Lilies well. I think we can all look forward to the time when success in the cultivation of Lilies will come to us. Would you pardon me if in closing I quote the final words from my father's book that he wrote seventy-five years ago :

"Cultivate Lilies for their purity, gracefulness, and because they so abundantly reward the patience of the persevering cultivator with increasing stateliness of form and luxuriance of growth. '*In tenui labor ; at tenuis non gloria, si rided Fortuna,*' which, briefly translated, means 'The labour is small, but the result by no means small should Fortune smile.'"

May Fortune smile on all cultivators of Lilies from this time forward.

ERRATUM.

IN the article by THOMAS WALSH and EDWARD J. CLARKE on "A Chlorosis of Tomatoes in Relation to Potassium and Magnesium Nutrition," which appeared in the July JOURNAL, the strength of the iron sulphate solution used should have been given as 0.25 per cent., not 0.5 per cent.

FLORISTS' FLOWERS—VI.

CHRYSANTHEMUMS.

By JOHN WOOLMAN.

It was in A.D. 926 that the Mikado UDA of Japan, an ardent lover of the Chrysanthemum, set the fashion by issuing an edict commanding that the whole realm be scanned, every garden ransacked, and the choicest specimens assembled at his palace in Tokio, for the delectation of himself and his courtiers.

That was over a thousand years ago, and it is a far cry from the yellow wrinkled Mongol in his garden in far-off Cathay, by the patient toil of a lifetime evolving the first cultivated varieties from the little wayside weed, to the city clerk in his suburb lovingly tending his plants that they may bear the magnificent elaborate blooms of to-day, as diverse as fantastically contorted dancers with streaming, wind-blown hair.

More than fifteen hundred years ago TAO MING-YANG, a connoisseur of all refined pleasures, walked in his garden amid the dainty or superb, graceful or quaint, Chrysanthemums that his consummate skill had brought to birth. He was the greatest of all Chinese breeders, and when he died the city where he had dwelt changed its name to Chuhsein, the City of Chrysanthemums.

The Chrysanthemum migrated to Japan from China and there became invested with almost sacred attributes. It became the symbol of the ruling dynasty as the sign or crest as it were of the Mikado, its use being strictly forbidden in any design save for imperial purposes. It is reproduced on state documents, emblazoned upon the doors of imperial carriages, engraved on the swords of the most exalted servants of the Emperor. The highest honour he can bestow is the Order of the Chrysanthemum, created for, and scrupulously confined to, royal and noble personages. The Ensign of Japan used right up to the present time is made up of a Chrysanthemum with its sixteen petals surrounding a centre disc or sun.

The development since those far-off days up to the present time has been steady and methodical rather than spectacular, nevertheless the improvement is most marked, with the result that to-day a new variety has to be perfect in every detail before it passes the critical scrutiny of the powers that be in order to obtain an award.

Among the multitudes of varieties which have been produced since the introduction to England from Japan my own memory goes back only some fifty years, and well do I remember that fine outdoor variety 'Madame Destranges,' grown to perfection in my father's nursery at Tyseley; other varieties grown were 'Sœur Melanie,' 'Elaine,' 'Lady Selborne' and a few others. Of the large Japanese type for exhibition 'Mrs. H. Weeks,' 'Miss Elsie Fulton,' 'Madame Carnot,' 'M. Theresa Pankoucke,' 'Pallanza,' 'Phoebus,' 'Richard Dean' and others were included in the collection.

Other types such as Decorative and Singles were included, but the marketing of the flowers was on a very small scale compared with the output of present times, and varieties were not very numerous. As far as my memory goes the November Singles were a very poor lot

in those days with very small flowers of Spray form, and in the Decoratives the flowering period did not extend into December. We can therefore see what great strides have been made not only in new colours but in the long flowering season now obtained. In attempting to give a calendar of varieties along the years it is impossible to include all the notable varieties, but perhaps the following notes may be of interest.

In the Exhibition Japanese around 1917 to 1920 such magnificent varieties as 'Queen Mary,' 'Majestic,' 'Mrs. Algernon Davis,' 'W. Rigby,' 'Edith Cavell,' 'Louisa Pockett,' 'Mrs. G. Munro,' 'Princess Mary,' 'Lady Talbot' were introduced, and in Incurved varieties 'Mrs. S. Dove,' 'Percy A. Dove,' 'Miss Eva Hudd.' Later, up to 1930, Exhibition Japanese 'James S. Kelly,' 'Mrs. A. Brown,' 'Mrs. T. Slack,' 'Yellow Majestic,' 'Mrs. A. Holden,' 'Red Majestic,' 'Marjorie Woolman,' 'Aquitania,' 'Birmingham' (1928) 'Hugh Mitchell,' 'Lancashire.'

1930 to 1940, 'H. E. Trueman,' 'Mrs. H. Habgood,' 'Remus,' 'James Bryant,' 'Henry Woolman' (1936) 'Sir Austen Chamberlain,' 'Yellow Trueman,' 'Duke of Kent,' 'Duchess of Kent,' 'Neville Chamberlain,' and in Incurved varieties 'Golden Glory,' 'Silver King,' 'Mahogany,' 'Progress,' 'E. Laundry,' 'J. Agate,' 'Yellow Globe.'

Along these years also the Decorative and Single varieties were greatly improved with such varieties as : *Decoratives*, 'The Favourite,' (1922), 'Golden Marvel,' 'White Cheer,' 'Gloriosa,' 'In Memoriam' (1924) 'Monument' (1927), 'Edward Page,' 'Aurora,' 'Fiona,' 'Joan Higgs,' 'Thanksgiving Pink,' 'Edith Alston,' 'American Beauty' (1933), 'Avondale Beauty' 'May Wallace,' 'The Ace,' 'Marie Morin,' 'Coralie,' 'Annie Curry,' 'Gladys Paine,' 'Gracie Fields.' *Singles*, 'Bronze Molly,' 'Phyllis Cooper,' 'Reg. Godfrey,' 'Susan,' 'Absolute,' 'Mr. A. Robertson,' 'Raleigh,' 'Golden Seal,' 'Joan Church,' 'Desert Song,' 'Rob Roy,' and 'G. H. Smart.' In the outdoor kinds great strides have been made with the advent of such wonderful varieties between 1920 and 1940 as 'Lichfield Purple,' 'September White,' 'Royal Salute,' 'Mrs. W. D. Cartwright,' 'Bronze Early Buttercup' (1925), 'H. Sutcliffe,' 'Arctic Circle,' 'Snowdonia,' 'Rose Precose,' 'Felicity,' 'Rose Princess,' 'Spartan,' 'Alfreton Beauty,' 'Primrose,' 'Corona,' 'Lancer.'

During war years, raisers have still continued their work, and many fine varieties are to be distributed.

An entirely new race has been evolved with a distinct dwarf habit, height 6 to 10 inches, the suggested name for these being Woolman's Lilliputs.* As many as one hundred and fifty double flowers on each plant are produced—surely a valuable addition to the Chrysanthemum world.

* There is an illustration of 'Lilliput Honeybird' in the R.H.S. JOURNAL, January, 1945, Fig. 9.

ON THE FLORA OF GREECE.

By M. OGILVIE-GRANT.

MOST people will have a good general idea of the characteristic plants of Greece, the majority of which are adapted to compete with a climate where scarcely a drop of rain falls from May to September, in other words, a place where the plants get a thorough baking through the summer; and as we in England are not able to give them this condition without a greenhouse or frame, the next best thing would seem to be a sunny position with good drainage.

Crete has been called "The Land of Spines and Scent," a description which fits a good many other parts of Greece. There however, more than anywhere, the leaves have narrowed into thorns which can endure the arid summer months. The very Mullein and Chicory have formed thorny bushes, the Cretan Maple is caught in an intermediate state, having both leaves and spines. Asparagus, *Euphorbia acanthothamnus*, prickly Astragali and *Poterium spinosum*, which the peasants stuff in the mouths of their pitchers as a filter, are the order of the hillside, interspersed with Cistus, narrow-leaved Thymes and *Phlomis fruticosa*. The scent of the Greek islands is wafted far out to sea, and at night it is the dry aromatic perfume of Thyme or Aleppo Pine which makes a passenger in the passing steamer conscious that land is near.

The gardener who arrives in Athens will be surprised to discover how many good plants may be found at his back door. If he walks up Lycabettus he will find several Crocus species growing under the Aleppo Pines, including *C. sativus* and large clumps of *Sternbergia lutea* against the rocks of the summit. In the suburb of Patisia, on the other hand, there is a rocky hill set among the villas which provides one of the localities given by Halacsy for *Fritillaria obliqua*, one of the few species which has a delicious scent.

In 1938 I had a flat on the River Ilyssos, which is now a rather dirty drain. It was my habit to set out quite early in the morning armed with a packet of sandwiches, a good stout handfork and a rucksack full of paper and envelopes, to walk up Hymettos, which towers over against the city and, by turning bright petunia pink every evening, provides Athens with her "Violet Crown." When you have passed through the refugee settlement the real country begins abruptly, taking here on the lower slopes of the mountain the rock garden formation which characterises so much of Greece. Huge white and grey rocks emerge everywhere on the surface, interspersed with pockets of Devon red soil. There are no trees except an occasional Pine with its complement of processional caterpillars or a prickly Oak (*Quercus coccifera*), which if the goats allow it will make one of the most compact and beautiful trees I know. But the whole ground is covered by an association of dwarf shrubs—Cistus, Euphorbia, Poterium, Globularia; this last as a rule so disappointing in England forms compact cushions of powder blue flower heads, and amongst them all, pressed between the rocks, pushing through the spiny bushes or grouped on the pockets of red soil, is *Anemone coronaria*, every colour of the rainbow, blossoming from November to April.

ATCHLEY in his *Flowers of Attica* writes: "The name *Anemone* (which should be accented on the third syllable) is said to be connected with the worship of the Syrian Adonis. *Anemone coronaria* loves open

spaces in the foothills and the sides of country tracts and paths and strongly dislikes the propinquity of trees"—though he adds: "There is a late variety red wine coloured which has not the family objection to trees." It is still indeed the case that the Anemones which grow along the Eleusinian Way, a few kilometres the other side of Athens, said to have sprung from the dead Adonis' blood, are predominantly scarlet, and there were many of the wine red form in a small cypress grove which had been planted on the lower slopes of Hymettos. There they grow in close association with *Hermodactylus tuberosus*. Here we may mention various other Greek Anemones. First comes *A. Pavonina*, more robust than *A. coronaria*, sometimes brilliant scarlet with a white or yellow base, sometimes mauve as where it grows beneath the ancient Olive trees in the Vale of Amphissa. Then there is *A. blanda*, often common, with deep blue or lilac flowers. In some places, for instance under the pine trees at Phylae above the Boeotian plain, it is pure white. Last I would like to remember the delicate *Anemone Heldreichii* from Crete, pale pink inside, powder blue beneath. In April particularly the Anemones are a sheet of glory. Before them in the beginning of the year come the pink and white spires of *Asphodel*, *Asphodelus microcarpus* and the slenderer *A. fistulosus*. In England they flower so early that there is little chance of their making any show, but seen with the transparent light of Attica shining through their delicate petals we can see why the ancient Greeks thought them fit companions for the shades of the departed.

But it is neither by Anemone nor by Asphodel that the real gardener will be chiefly absorbed. On every hand there is a bewildering variety of bulbous plants, few of which appear in our gardens. In spring the firm round leaves of *Cyclamen graecum* are everywhere to be seen. In digging them it is better to avoid the giant potatoes and choose the smaller corms. So often the former have made a brittle stem between leaves and corm, and if this is snapped all is lost. Anyhow *Cyclamen graecum* is too tender for any but the most sheltered corners. *Cyclamen neapolitanum*, on the other hand, is an invaluable plant, equally fascinating in leaf and flower. There is a wonderful variety in the leaf form and colour. I particularly recall those under the tall shrubs in the Vale of Tempe which looked like broad green and silver daggers.

Cyclamen repandum grows freely in parts of the Peloponnese and bears a close resemblance to *C. creticum*, both having ivy-like silver patterned leaves, though in the latter the sweet-scented flowers are white. These are not very hardy plants, but Mr. BOWLES has them flourishing in large deep wooden boxes on the shelves of a cool house. I think he also has a pale pink form of *C. creticum* which may link up the two species. *Cyclamen persicum* seen in nature makes one feel that the Creator has much better taste than the average breeder of plants. The original species occurs in Cyprus and its graceful winged flowers, which are deliciously scented, stand clear above the foliage, thus showing qualities which no one could attribute to the modern greenhouse forms.

There are some ideal subjects for the sink garden or the Japanese basin, for instance *Romulea linairesii* with its purple stars, or the tiny white *R. columnae*. *Lloydia graeca* too provides a perfect Lily in miniature for the Japanese garden. Gagea is a genus well represented in Greece—I think Halacsy gives fifteen species—and as the delicate yellow flowers appear early in the season it is worth growing more freely at home. On walks from my prisons in North Italy it was the

first flower to appear by the roadside after the Aconites which push through the bare ploughed fields.

Crocuses form an important feature of the Greek Flora, and when I did some collecting there with Mr. BOWLES my eye became well trained to spot the conspicuous white-lined leaf which spells *Crocus*. We found some species in Attica and the Peloponnese, but the visitor who goes no farther than the suburbs of Athens can bag at least five. As I have said, the Saffron *Crocus* grows in the heart of the town on the top of Lycabettus. If, on the other hand, you go down to the sea coast at Phaleron, on the flat ground which constitutes the beach you will find *Crocus cancellatus*, a white form with mauve lines, flowering in September when the first rain has fallen. It is easy to find the coarsely netted corms in sandy hummocks among the mats of *Lithospermum* and *Matthiola sinuata*. They are very like those of *Gynandiris Sisyrinchium*, which grows everywhere in the Mediterranean region. *C. laevigatus* grows on the paths up Hymettos. Its smooth nut-like corms can easily be distinguished from those of other species. The Attic form is generally white feathered with purple and it flowers conveniently in mid-winter. *C. Sieberi*, the purple form, is very common in the woods above Athens, where it blooms in March associated with *C. aureus*, to my mind the most beautiful of all species. You can find them both in the woods at Tatoi where the King has his country house—*Sieberi* with netted corms and *aureus* emerging from a brown dog collar with flowers of a wonderful burning gold which make those of the Dutch Yellow look washed out by comparison. The Tatoi form has usually one or more lines of chocolate on each petal in contrast with the Istanbul variety, lined with grey, which is reputed to be our garden friend's ancestor, though where the latter lost its fine pods of crimson seed is wrapped in mystery. Here we may mention two interesting varieties of *C. Sieberi* from other parts of Greece. In Attica, as I have said, the flowers are purple with a yellow basal zone, though now and then a white form occurs. The yellow base is constant, but in the Morea we find a three-coloured form like the drink called a *pousse-café*, or to quote Mr. BOWLES "an egg in an egg-cup," due to the white band which divides the yellow basal zone from the mauve tips of the petals. *C. Sieberi* var. *versicolor*, which occurs in Crete, is an even more striking plant. In the White Mountains where I have collected it, the flowers can hardly wait for the snow to finish before their glittering white cups burst out from the edges of every patch accompanied by the pale blue stars of *Chionodoxa nana*. Then when the light is off them the cups close to reveal the astonishing colour of their outside, yellow and white with the brick purple of a Peacock Butterfly's wing. Their blossoming seems to depend on the melting of the snow and may continue here and there into June. An allied species, *C. veluchensis*, with smaller corms and a white basal zone, grows near the summit of Parnassos, where I have found it flowering in July, while a few yards away, where the snow had gone, the flowers were not only dead but dried up.

In 1940 I was stationed in Cyprus from October till March and had a good many opportunities of observing the flora. *Crocus cyprius* grows in clearings of the Pine woods on the Troodos Range. I mention it here because its colour combination suggests *C. Sieberi* var. *versicolor*, with the same brown-purple blotches though the flowers are much more slender and the basic colour is lilac. It comes out too in early spring. *Crocus veneris*, a small white species appropriately named if we recall that the Goddess' prototype Astarte was here worshipped

in the form of a white cone, is common on the lower hills. It flowered in November on the hills round Lefka, springing up with the young grass and *Ranunculus bullatus* above the workings of a copper mine which has been there since Roman times. In 1938 Mr. BOWLES identified both these species and the black-anthered *C. Crewei* from leaves and corms which we found near Tripolis in the Peloponnese. In October, 1941, I was again at Tripolis though this time living in somewhat reduced circumstances awaiting trial as a spy. However, the Italian guard who was deputed to exercise me on the neighbouring hillsides proved quite an amenable companion and I was able to borrow his bayonet and dig up some fine specimens of *C. Boryi*, a large and beautiful white species which comes out at the same time as *Sternbergia lutea*, which was making a splendid show among the rocks. I see that in this brief mention of Greek Crocuses I have not alluded to *C. chrysanthus*, which Mr. BOWLES' lovely hybrids have made more familiar to gardeners than most. The form of this variable species which I have collected above Delphi was golden yellow. It flowered in March on the edge of receding snow together with a small mauve Colchicum, which has I fancy the attractive name of *Colchicum bulbocodioides*. The third yellow Crocus which occurs in Greece, *C. Olivieri*, can be picked out by its abnormally wide leaves. It grows plentifully in the Boeotian plain and near Tripolis.

Here I should like to mention two rhizomatous Greek Irises, both of which do well in English gardens. First *Iris pumila* var. *attica* the delightful dwarf flag which grows in sturdy clumps on the hillsides of Attica, Boeotia and the Peloponnese. There are many colour forms, pale green, white, pale and deep yellow, blue and purple. I found a rust-red form at Tatoi and in my garden there is a beautiful Peloponnesian with plum-coloured falls and an Eton blue beard. This is a plant which I am anxious to raise in quantities from seed. The other good Iris—*I. cretense*—is the Greek form of *I. unguicularis*. We collected a good purple form among the Gorse bushes at Levadia, where it flowers in March, thus continuing the series of mauve pencils which this useful plant produces all through the winter. *Gynandiris Sisyrinchium*, according to ATCHLEY sometimes called Barbary Nut, though a very decorative plant with its white spotted lilac flowers, does not I fancy succeed in England. In Greece it burgeons on all the hottest and driest patches and round the Temple at Sunium there is a dwarf with flowers the size of a threepenny bit. Colchicums abound in Greece. It is hard to avoid digging up the bulbs with other plants. In September, 1941, though not at the time engaged in plant hunting, I could not help seeing *C. Sibthorpi*, perhaps the finest of all, flowering among the trees on the Taygetos foothills. Its large purple tessellated flowers were opening among dead bracken and Cyclamens under the wide Oaks—*Quercus aegilops*—whose acorns are collected by the peasants for use in tanning.

True Lilies are not numerous in Greece. The orange *Lilium Heldreichi* is found in the woods at Tatoi according to H.M. The King, who did his best to preserve it, and the well-known 'Salonica' form of *L. candidum* is said to grow in the Vale of Tempe. Some people believe it to be a garden escape though it is hard to imagine how it could be so in such a locality. Certain it is that Madonna Lilies form an important feature of Greek cottage gardens, where they grow with conspicuous success alongside the Hippeastrums and Eggplants in Shell petrol tins painted white. Again, the Narcissi are not very much to the fore in this part of the world, though the rather uninteresting stars

of *Narcissus serotinus* appear everywhere on the low ground in Crete and other places after the first autumn rain. Tulipa and Fritillaria, on the other hand, are two particularly interesting Greek genera. The first and more obviously decorative of these is represented in the neighbourhood of Athens by three species. *Tulipa australis*, a very sweet-scented pure yellow, is to be found among the boulders on the very top of Mt. Hymettos, where to the best of my recollection it flowers about June. *T. orphanidea*, orange, yellow and green, grows in large patches, far more leaves than flowers, beneath isolated trees by the road at Tatoi. *T. boeotica*, scarlet with a black basal blotch edged with yellow, is seen in thousands among the cornfields of the Boeotian plain. Large bunches of the flowers are sold in the streets of Athens, but woe betide the gardener who plans to dig up a few bulbs when the leaves have died down. The soil in which the wise Tulips have embedded themselves to the depth of a comfortable two feet is baked harder than a brick. The instrument known as a fern-trowel will bend back like a boomerang even if it doesn't break off altogether and hurt you. A good strong fork and a pair of horny horticultural hands are the most practical implements. In lifting Fritillaries particularly the hands are often even more important than the fork. So often they grow through some thorny bush or with their bulbs squashed between the boulders, and it is often a most delicate operation to trace the white thread-like stem to its logical conclusion and extract the whole thing unbroken. The Cretan Tulips are particularly attractive, and *T. saxatilis* at least flourishes in many British gardens. DYKES says it is a very hard Tulip to flower, but I certainly remember a most floriferous border of them at Highdown, but I suppose that is only to be expected with the combined influences of Colonel STERN and a good sunny border. At Malaxa, about 800 ft. above Suda Bay, it grows among rocks on the cliff face associated with *Ranunculus creticus*, a good plant which for the last five years has here thrown up its large pale green rosette and a branched head of big yellow buttercups without any attention at all, and the sinister spotted trumpets of *Aristolochia cretica*, which I have never seen anywhere else. The tiny Cretan Tulip has a wide range in the island. About March I have found it flowering quite low down in the district of Elos, and again high on Mt. Volakia, about 6,000 ft. above sea level, its flowers were dotted among the scree as late as June. It also has the yellow basal zone of *T. saxatilis*, but the open flower is white and there are reddish bands on the outside of the petals somewhat resembling those of *T. clusiana*, a species which is said to grow wild in the island of Chios, though I have not myself seen it. Then there is *T. Bakeri*, which Mr. G. P. BAKER collected in the eastern part of the island. I brought home specimens from the Plain of Omalo in the west paler in colour than his. It was growing there in the stubble of a cornfield and the flowers closely resemble those of *T. saxatilis*, though I never found more than one head on a plant. Both the last Tulips have flowered well with me in pots on a cold greenhouse shelf. They were watered from October till the flowers were over and then left dry. In an Olive grove above Rethymnon there is a large red Tulip, *T. Doerfleri*, but so closely does it follow certain strips of cultivation that I cannot believe it is a native.

I went to Greece in 1938 with the intention of collecting as many species of Fritillary as I could for cultivation in this country. The Greek species, if we except the rather coarse *F. libanotica*, which is common in certain parts of Cyprus, are to my mind all very well-bred

looking plants. As I have said before, you need go no farther than an Athenian suburb to find the sweet-smelling *F. obliqua*, and *F. graeca*, with its attractive chequered bells which unhappily smell far from sweet, is common on the top of Hymettos. To find the other Greek species, however, it is necessary to visit a number of rather outlandish places, as they are for the most part extremely local. The first on my list was *F. rhodokanakis* which is, as far as I know, confined to the Monastery of the Prophet Elias on the Island of Hydra. This is a pleasant expedition from Athens. The paddle steamer left at 8 in the morning and everyone sat on deck eating, playing guitars, or being seasick. Arrived in the little port of Hydra, you have to walk up a fairly steep hill to where the Olive terraces of the monastery run parallel across the way buttressed with stone dykes against which grow the Fritillaries, attractive chequered bells of purple and green. This species is not unlike *F. graeca*, but taller and more slender. To find *F. tuntasia* it is necessary to visit the Island of Cythnos. It resembles *F. obliqua* so closely, however, and the journey to Cythnos as I made it is so uncomfortable, that most gardeners would be content to possess one of the species alone. It also occupies open spaces in the shelter of boulders and stone dykes, which give the roots a cool run. The late Mr. ROSENHEIM, who grew a prodigious number of Fritillaries in his small garden at Molesey, showed me the Greek species flowering and seeding happily in scree beds on the open lawn. *F. ionica* is to my mind the most beautiful Greek Fritillary. It is tall and graceful with apple-green bells containing the familiar teardrops of the Crown Imperial. I found it in the late spring growing in grass beside some large rocks not far from the summit of Mt. Pantocrator, the highest peak in Corfu; later I saw it flourishing in a cool house at Nymans, and I have also grown it myself in pots. *F. conica* is a small yellow species with quite disproportionately large bulbs which grows on a hill near Navarino. The only other thing which sticks in my mind about the hill is that it is topped by a chapel and a notice to the effect that those who sacrifice paschal lambs outside are forbidden to leave the relics lying about. *F. messanensis* is to me a sore subject, as it was found, photographed, and exhumed by PETER DAVIS in Crete the same year in which I was doing my best to make a complete collection of the local species, while I, in spite of a walk so long that my shoes wore out and had to be fortified with cheese rinds, failed to discover it. Another subject even sorer is a Fritillary which in 1937 I met in a wood on Samos. The flowers were nearly dead but looked as though they might have been pink. Unfortunately, however, I did not realise at the time that this is one of the localities from which no plants may be exported on account of the vine disease, and my treasures had to be left at the quay side. However we shall see what the future brings.

In spring on the Greek hillsides an astounding plant is to be seen and, when you get to windward of it, smelt. This is *Drancunculus vulgaris*, a huge spathe which looks from a distance black, and leaves like green hands on a spotted stem. GERARD figures it in his *Herbal* as the great Dragon, but confesses that he does not know where it grows. "As yet," he says, "I take it for a fained picture." And so might anyone seeing it in nature for the first time. *Arisarum vulgare*, which the herbalist calls the Friars Cowl, is, on the other hand, a thoroughly attractive little member of the same family with green and white striped hoods which are very common in Greece during the spring. Another good Aroid is the large yellow Cretan 'Lord and

Lady,' which is to be found under the tall Plane trees not far from the birthplace of that famous statesman, M. VENIZELOS.

Nearly everywhere in Greece terrestrial Orchids abound, particularly the various species of *Ophrys*, no two specimens of which ever seem to be alike. *Ophrys lutea*, *O. fusca* like a black and blue bumble bee, and *O. tenthrediniflora* like a pink winged geometric spider, are generally found among the undershrubs on the open hillside or in Pine woods, while the species of Orchis tend more to occupy the stream banks and marshes. These fascinatingly beautiful plants are far too little grown, but they can again be seen flourishing in Colonel MESSEL's cool house at Nymans, almost deprived of moisture during the summer months. The wonderful variety of flower forms, from the stately mauve and green spires of *Barlia longibracteata* to the twisted tails of the Lizard Orchis or the brick-red horns of *Serapias*, make them a most intriguing subject for the collector.

Looking back, it is pleasant to recall whole groups of plants growing together in their natural setting. Just as a piece of furniture moved to a museum from the room where it formed part of the scene loses its life if not its interest, so a plant isolated in an earthenware pan often makes a pathetic picture when we remember it at home. In the course of this talk I have already mentioned several plant associations, and I shall now try to give you one or two Greek pictures as they come to mind. The first is in Attica in spring with the corn nearly ripe for harvest. Under the clear blue sky and the grey-green ovals of the Barbary Figs which form a hedge beside it, the field is glowing with the blood-red Attic Poppies, each with its basal blotches neatly edged with white. Contrasted with them are Larkspurs of the deepest ultramarine and the pink swords of *Gladioli*, while if we look beneath the taller growers there are Venus' Looking Glass and the curious oblong yellow flowers of *Hypocotyle*.

Then one recalls the coastal road between Canea and Rethymnon in Western Crete. This time our flowers have for their background the Mediterranean bluer than anything we have at home, and there only rivalled by the sheets of Viper's Bugloss. Alternating with them are great patches of *Ranunculus asiaticus*, white, rose-pink or white with rose-pink frills and drifts of the yellow-zoned *Chrysanthemum coronarium*. And as the passenger tries to ride with the tumbledown old automobile as it leaps in a cloud of dust from one huge pothole to the next, the kaleidoscopic flowers and the blue sea with its white horses give him courage to enjoy this wild erratic progress. I have often tried to envisage the fighting along this strip of road with the different coloured German parachutes dropping from a cloudless sky and wondered whether there was a gardener among the defenders of Maleme, who would have noticed that there alone the *Ranunculus* is bright yellow and *Ophrys tenthrediniflora* has plum-coloured wings.

But there is no end to the plant pictures which flash through one's mind. The flattened shrubs on a Cretan mountain—*Prunus prostrata*—*Anchusa caespitosa*, the bluest cushion in the world, relieved by the little yellow tubes of *Onosma*—or the mat of Marigolds and tiny Muscari under a tent of white blossom among the broken columns of Delphi.

I have scarcely said a word about the Greek annuals or the countless good plants for rock garden and herbaceous border, but it is my great ambition one day to find a steep sunny bank with rocks bursting from it here and there, where I can make a garden entirely of Greek plants.

On the upper part of the bank would grow *Arbutus unedo* and, if she could be persuaded, *Andrachne*, with Myrtle and the Mediterranean Heath, the small trees which brush the sides of your mule as he picks his way along the cobbled footpaths of Mt. Athos. Below them would be the shrubs from *Phlomis fruticosa* and *Cistus* down to the little Thymes and *Calaminthas* sheltering the roots of innumerable bulbous plants, which in their turn would give place to annuals never encountered in the seed catalogue. In Greece where such a garden could so easily be made, there are no true Botanic gardens, and if the average inhabitant of the country tries to make a garden he will think in terms of grateful coolness in the heat and concentrate on the unequal struggle to maintain his patch of green lawn shaded by trees. But having on my way round the Cape of Good Hope been privileged to visit the wonderful Kirstenbosch Garden of South African plants extending naturally up one flank of Table Mountain, I cannot help reflecting what a revelation both to the visitor and to the Greek himself it would be if such a garden were created on the slope of Hymettos to exhibit the astonishing floral variety of this most enchanting country.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Begonia 'Ballet Girl.' A.M. July 3, 1945, as a greenhouse flowering plant. Flowers double, 6 inches diameter, white edged and flushed with pale carmine (H.C.C. 21/3), margins of the petals much waved. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlviii.

Begonia 'Salmonea.' A.M. July 3, 1945, as a greenhouse flowering plant. Flowers very fully double, 6 inches diameter, mandarin red (H.C.C. 17/1), with waved margins. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlviii.

Begonia 'Scarlet Flambeau.' A.M. July 3, 1945, as a greenhouse flowering plant. Flowers double, 6 inches diameter, with rose shaped centre and reflexed outer petals, fire red (H.C.C. 15). Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlviii.

Border Carnation 'E. M. Wilkinson.' A.M. July 3, 1945, as an exhibition picotee variety. Flower stems rigid. Flowers double, 2½ inches diameter; petals white edged with a shade of Claret Rose (H.C.C. 021/1); calyx strong. Shown by W. G. Ferris, Esq., Woodhurst, High Warren, East Horsley, Surrey. See p. xlx.

Border Carnation 'Evelyn Knapton.' A.M. July 3, 1945, as an exhibition white ground fancy variety. Flower stems stout, rigid. Flowers double, centre slightly open, 3 inches diameter, petals white, edged and flecked with Claret Rose (H.C.C. 021); calyx strong. Raised and shown by H. A. Knapton, Esq., Wistaria, Bognor Regis, Sussex. See p. xlx.

Border Carnation 'Rose Frills.' A.M. July 3, 1945, as an exhibition picotee variety. Flower stems stiff. Flowers double, open centred, 2½ inches diameter; petals white, edged with Rose Opal (H.C.C. 022/1); calyx strong. Raised and shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex. See p. xlx.

Cypripedium niveum var. 'Goliath.' F.C.C. July 3, 1945. A large and well-formed variety of this charming species. The pot contained several plants, with a total of seventeen flowers, which are snow-white with minute spotting on the basal half of the petals. Exhibited by

Sir William Cooke, Bt., Wyld Court, Hampstead-Norris, Berks. See p. xlix.

Delphinium "Blackmore's Blue," A.M. June 19, 1945, as an exhibition variety. Flower spikes 24 inches long. Flowers semi-double, $2\frac{1}{2}$ inches diameter, a shade of Cobalt Blue (between H.C.C. 44/1 and 44/2), base of inner petals slightly flushed pale Imperial Purple (H.C.C. 33/3); eye small, white. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlii.

Delphinium "Minerva," A.M. June 19, 1945, as an exhibition variety. Flower spikes $2\frac{1}{2}$ feet long. Flowers semi-double, $2\frac{1}{2}$ inches diameter, a deeper shade of Spectrum Violet (H.C.C. 735), outer petals tipped deep Cornflower Blue (H.C.C. 742); eye large. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlii.

Delphinium "Princess Alexandra," A.M. June 19, 1945, as an exhibition variety. Flower spikes 2 feet long. Flowers semi-double, $2\frac{1}{2}$ inches diameter, a shade of French Blue (between H.C.C. 43 and 43/1), inner petals faintly flushed Petunia Purple (H.C.C. 32/2); eye large, white. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlii.

Delphinium "Pyramus," A.M. June 19, 1945, as an exhibition variety. Flower spikes 2 feet long, flowers closely arranged. Flowers semi-double, 3 inches in diameter, outer petals French Blue (H.C.C. 43/1), inner petals Violet (between H.C.C. 36/1 and 36/2), slightly tipped French Blue (H.C.C. 43/1); eye very small. Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. xlii.

Deutzia setchuenensis var. *corymbiflora*. A.M. July 3, 1945. *Deutzia setchuenensis* is one of the most beautiful members of the genus, and was introduced to this country from China about half a century ago. It forms an open bush up to 6 feet high, with ovate-lanceolate, acuminate leaves up to 4 inches long, and numerous loose corymbs of starry, pure white flowers. In the variety the leaves, inflorescences and individual flowers are somewhat larger than those of the type. Exhibited by W. Bentley, Esq., Quarry Wood, Newbury. See p. xlix.

Laeliocattleya \times 'Babylon' Westonbirt var. A.M. July 3, 1945. The spike bore four large flowers of rosy-mauve colour, the expansive labellum having a crimson front and gold markings in the throat area. Raised and exhibited by Messrs. H. G. Alexander, Ltd., Tetbury, Glos. The parents were *Lc.* 'Ishtar' and *Lc.* 'Sargon.' See p. xlix.

Lilium \times *aurelianense*. A.M. July 3, 1945. A very distinct hybrid raised from *L. Sargentiae* and *L. Henryi*. The plant exhibited was raised by J. E. H. Stooke, Esq., of Hereford, and bore a fine head of eight flowers, Pale Straw Yellow (H.C.C. 604/2) in colour, suffused with apricot near the centre. The perianth-segments are $4\frac{1}{2}$ inches long, the inner about $1\frac{1}{2}$ inch wide, the outer narrower, with recurved tips. Exhibited by Messrs. W. A. Constable, Ltd., Southborough. See p. xlix.

Lilium \times 'Coronation.' A.M. July 3, 1945. Raised by Miss Preston at Ottawa from a cross between *L. Davidii* var. *Willmottiae* and a seedling of *L. dauricum*. The plant has a stiff, dark stem bearing a terminal raceme of about fifteen flowers, of a flattish Turk's-cap form. The segments, which are remarkably firm, are nearly 3 inches long, Buttercup-yellow (H.C.C. 5) with small maroon spots. The conspicuous chocolate anthers afford pleasing contrast. Exhibited by W. Bentley, Esq., Quarry Wood, Newbury. See p. xlix.

Lilium 'Phyllis Cox.' A.M. June 19, 1945. A very fine hybrid Lily raised by Miss Preston at Ottawa about sixteen years ago. The tall, stiff stem is clothed throughout its length with firm, deep green, lanceolate leaves up to 5 inches long and bears a terminal raceme of nearly thirty well-spaced flowers on long patent peduncles. The perianth-segments are $2\frac{1}{2}$ inches long, the inner ovate-lanceolate, the outer narrower, all strongly recurved; in colour they are Indian Orange (H.C.C. 713), shading outwards towards Dutch Vermilion (H.C.C. 717), with small, scattered, dark spots. Exhibited by Walter Bentley, Esq., Quarry Wood, Newbury. See p. xlv.

Nymphaea 'Sunrise.' A.M. July 3, 1945. A beautiful hardy Waterlily with about thirty narrow-elliptic petals $4\frac{1}{2}$ inches long, of Pale Primrose-yellow (H.C.C. 601/1) deepening towards the centre, which is occupied by a cluster of bright canary-yellow stamens. Exhibited by Major E. de Rothschild, Exbury, Southampton. See p. xlix.

Odontoglossum \times **'Asca'** var. **'Argus.'** A.M. July 3, 1945. The spike bore seven flowers, the broadly-developed segments of golden-yellow colour with red-brown spots. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. The parents were *O. 'Ascania'* and *O. hellemense*. See p. xlix.

Rhazya orientalis. A.M. June 19, 1945. An attractive herbaceous plant discovered over a century ago in N.W. Asia Minor. It enjoys a moist place in the border, where it forms large clumps of slender stems 2 feet high, bearing ovate-lanceolate, bright green leaves and terminal panicles of flowers which are effective for several weeks. The star-shaped corollas are $\frac{1}{2}$ -inch across, in colour a greyed tint of Lobelia Blue (H.C.C. 041/1), which is enhanced by the indigo hue of the calyces and pedicels. Exhibited by C. H. Curtis, Esq., Brentlea, Boston Manor Road, Brentford, and Major E. de Rothschild, Exbury, Southampton. See p. xlv.

Rhododendron 'Impy.' A.M. June 19, 1945. The very dark colouring of this hybrid is distinctive; the flowers, on longish stalks, are held in small trusses and are $2-2\frac{1}{2}$ inches across, the corolla being funnel-shaped with the petals slightly frilled. The colour is very dark red (H.C.C. 826) but lights up to a brilliant red when seen by transmitted light. The parents of this hybrid are *R. didymum* and *R. 'Moser's Maroon.'* Shown by Major Edmund de Rothschild, Exbury, Southampton. See p. xlvii.

Rhododendron 'Red Cap' var. **'Townhill Park.'** A.M. June 19, 1945. This hybrid between *R. didymum* and *R. eriogynum* has small, bell-shaped flowers $1\frac{1}{2}$ inches across, the colour being Oxblood Red (H.C.C. 000823), which lights up to scarlet against the light. Shown by the Rt. Hon. Lord Swaythling, Townhill Park, Southampton, See p. xlvii.

Rosa filipes var. **semi-plena.** A.M. June 19, 1945. *Rosa filipes* was introduced to cultivation in 1908 from N.W. Szechwan, where it was discovered by E. H. Wilson, and was also collected six years later by Reginald Farrer in S. Kansu. The long, rambling growths bear large leaves with five or seven elliptic or lanceolate, dark green, glabrous leaflets, and sharp, scattered thorns. The white, sweetly-scented flowers are borne in many-flowered, corymbose panicles. In the semi-double form the flower is $1\frac{1}{2}$ -inch across, and has a prominent central cluster of golden stamens. Exhibited by Dr. M. Amsler, Delmonden Manor, Hawkhurst, Kent. See p. xlv.

BOOK NOTES.

"Miniature Alpine Gardening." By Lawrence D. Hills. Sm. 8vo. 192 pp. Illus. (Faber & Faber Ltd., 24 Russell Square, London, 1945). 8s. 6d.

The purpose of this book is to assist people who are interested in Alpine plants to grow them well in a restricted space—pan, trough, or little garden; the choice of receptacle, suitable soil, lay-out and planting, and the all-important after-care are dealt with in a practical manner, and distinction is made between miniature Japanese gardens intended only for decorative purposes (which are not included here) and serious attempts to grow alpine in a limited area. The plants recommended are all of neat habit and warning is given against some which would prove too invasive; they are listed under several categories—colour, flowering dates, special purposes—and also dealt with individually. There are some good illustrations, four of them in colour. This little book should prove very helpful to anyone wishing to form a collection of interesting plants but without the facilities of a garden; and if opportunity permits the enlargement of the area to a real rock garden at a later date, the beginner who has followed the instructions here given would have nothing to unlearn.

"Root Disease Fungi." By S. D. Garrett. 8vo. 177 pp. Illus. (Chronica Botanica Co., Waltham, Mass., U.S.A.; and Wm. Dawson & Sons, Ltd., London, W. 1, 1944.) \$4.50.

The purpose of this book is to emphasize the relationship between root-fungi and the soil; the soil environment varies far less than that above ground, so that problems of root disease control depend more on the method of cultivation—field or glass-house, etc.—than on geographical position and are similar for tropical and temperate regions. The book is not a text-book; only certain of the parasitic fungi and the best means of eliminating them are considered, and these in considerable detail.

"Fragmenta Papuana." By H. J. Lam. Sargentia V. 4to. 196 pp. Illus. (Arnold Arboretum of Harvard University, Mass., U.S.A., 1945). \$3.00.

The flora of New Guinea had not been extensively studied but from 1925 onwards the Arnold Arboretum sponsored expeditions to Papua, the Solomon Islands and the New Hebrides. New Guinea fell into enemy hands and the necessity for emergency foods created a demand for information. It was therefore decided to publish Professor Lam's account of his experiences and observations on the vegetation of Dutch New Guinea; their translation has been undertaken by Dr. Lily M. Perry. The account consists of seven articles published between 1927 and 1929, describing the journeys undertaken by the author, the country, the people and especially the vegetation. There are two maps and 32 text-figures from drawings by Prof. Lam himself.

"Fruit Growing: Modern Cultural Methods." Edited by N. B. Bagenal. 8vo. 476 pp. Illus. (Ward, Lock & Co., London.) 30s.

This is a new edition of a work which is already well known to fruit growers who will welcome the complete revision that has been undertaken. An important new chapter has been added on "delayed open-centre" trees.

"Trees and Toadstools." By Dr. M. C. Rayner. 8vo. 71 pp. Illus. (Faber and Faber, 1945.) 6s.

We have already noted (*R.H.S. Journal*, 59, 1944, p. 312) the book on "Problems in Tree Nutrition" by the same author with W. Neilson-Jones; that was concerned chiefly with forestry problems, but the results of that investigation were of such interest that many people will welcome the present work in which the subject of the association of roots with soil fungi is described for the non-scientific reader. It is obvious that much more attention will have to be paid in future to soil conditions that are favourable to the development of such an association which is far commoner in the plant kingdom than was at one time supposed.

"Threshing of Grass, Root and Vegetable Seed Crops." 8vo. 20 pp. Illus. Bulletin No. 130, Ministry of Agriculture and Fisheries. (H.M. Stationery Office, 1945.) 9d.

The information contained in this *Bulletin* is designed to help particularly growers who are new to seed production in this country, where it is hoped that the recent expansion of seed growing may become a permanent feature. Details with illustrations are given of various threshing machines, and a chart summarises the adjustments needed for various types of seed.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part II

November 1945

THE SECRETARY'S PAGE.

Calendar for 1946.—Arrangements are being made to carry out the following calendar of events in 1946. In addition to the information given, lectures are being arranged to take place on the first day of each of the Shows. The lectures will be at 3 P.M. instead of at 2.30 P.M., complying with the requests that have been received. It will also be noted that all the Shows are two-day Shows, and on the first days will be open till 6 P.M., whereas on the second days the closing hour will be 5 P.M. In May there will be again a three-day Show in both Halls, and it is hoped that in 1947 the Chelsea Show may take its place.

Calendar of Shows.

Feb.	19	12 noon to 6 P.M.	Fortnightly Show.
			(Annual General Meeting at 3 P.M.)
	20	10 A.M. to 5 P.M.	Second day of Fortnightly Show.
Mar.	12	12 noon to 6 P.M.	Fortnightly Show.
	13	10 A.M. to 5 P.M.	
	26	12 noon to 6 P.M.	Fortnightly Show and Daffodil Competition.
	27	10 A.M. to 5 P.M.	
Apr.	16	12.30 to 6 P.M.	Fortnightly Show, Daffodil Show and Sewell Medal Competition for Alpines.
	17	10 A.M. to 5 P.M.	
	30	12 noon to 6 P.M.	Fortnightly Show and Rhododendron Competition.
May	1	10 A.M. to 5 P.M.	
	14	12 noon to 6 P.M.	Fortnightly Show, Flowering Tree and Shrub Competition and Sewell Medal Competition for Alpines.
	15	10 A.M. to 5 P.M.	
	28	12 noon to 7 P.M.	Special Spring Show.
	29	10 A.M. to 7 P.M.	
	30	10 A.M. to 5 P.M.	
June	18	12 noon to 6 P.M.	Fortnightly Show and Flowering Tree and Shrub Competition.
	19	10 A.M. to 5 P.M.	

July	2	. 12 noon to 6 P.M.	} Fortnightly Show and Lily Competition and Soft Fruit Competition.
"	3	. 10 A.M. to 5 P.M.	
"	16	. 12 noon to 6 P.M.	} Fortnightly Show and Clay Cup Competition for Scented Roses.
"	17	. 10 A.M. to 5 P.M.	
"	30	. 12 noon to 6 P.M.	} Fortnightly Show, Fruit and Vegetable Competitions and Hardy Flower Competition.
"	31	. 10 A.M. to 5 P.M.	
Aug.	13	. 12 noon to 6 P.M.	} Fortnightly Show and Foremarke Cup Competition for Gladioli.
"	14	. 10 A.M. to 5 P.M.	
Sept.	10	. 12 noon to 6 P.M.	} Fortnightly Show, Cactus and Succulent Competition and Flower Arrangement Competition for Amateurs.
"	11	. 10 A.M. to 5 P.M.	
"	24	. 12 noon to 6 P.M.	} Fortnightly Show.
"	25	. 10 A.M. to 5 P.M.	
Oct.	8	. 12.30 to 6 P.M.	} Fortnightly Show and Fruit and Vegetable Show; also Flower Arrangement Competition for Professionals.
"	9	. 10 A.M. to 5 P.M.	
"	22	. 12 noon to 6 P.M.	} Fortnightly Show, Orchid Challenge Cup Competition and Tree and Shrub Competition.
"	23	. 10 A.M. to 5 P.M.	
Nov.	5	. 12 noon to 6 P.M.	} Fortnightly Show.
"	6	. 10 A.M. to 5 P.M.	
Dec.	3	. 12 noon to 6 P.M.	} Fortnightly Show.
"	4	. 10 A.M. to 5 P.M.	

Subscriptions.—Notices to all the Fellows subscribing through banks have been posted; it is pleasant to report that the response to the changes in the subscriptions is very gratifying. Notices to those paying their subscriptions direct will be posted during the month, and will again draw attention to the President's message in the September JOURNAL. It would be of material assistance to the administration of the Society if prompt attention could be given, in order that the tickets for 1946, on which the above enlarged programme will be given, may be despatched as quickly as possible.

Final Meetings in 1945.—There will be no Shows of the Society in November and December, but the Fruit Committee will meet at the usual hour on November 13, and the Orchid Committee will meet on December 11 at 11.30 A.M. The fruits, vegetables and plants to be submitted should be delivered not later than 10 A.M. on the morning of the day of the meeting or, if sent by post, should reach the Society's offices at least a day before the meeting.

The National Chrysanthemum Society is holding a Show on November 6 (12 noon to 5 P.M.), in the Old Hall, to which Fellows' tickets will admit.

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during November and December:

Fruit Garden.

Nov. 7, 8	. Planting of Fruit Trees and Roses	. . . 2-4 P.M.
Dec. 5, 6	. Pruning of Fruit Trees	. . . 11 A.M.-1 P.M.

Fellows and Associates desiring to attend should notify the Director, R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

Publications.—Copies of the R.H.S. Gardeners' Diary are now available, and orders should be accompanied by a remittance. The diaries, as last year, will be in short supply, the selling price, including Purchase Tax, being as follows :

In Pluviusin *without pencil*—3s. 1d., post free.

In Morocco leather with pencil (*supply exhausted*).

Refills for Crocodile cases—2s. 4d., post free.

The Crocodile cases to take refills are unobtainable this year.

A new publication is now available on the National Fruit Trials, 1921-1944, price 5s., post free. This contains a description of the work of the National Fruit Trials for the period indicated, and it should prove of value to all interested in fruit, both from the amateur and the professional point of view. Perhaps the members of the Fruit Group would kindly note this.

Hall Lettings.—"The People" will hold a Pigeon Show in the Old Hall on November 29 and 30 and December 1. Anyone interested in the exhibition is asked to apply to the organizers, "The People," 222-225 The Strand, London, W.C. 2, for particulars.

WISLEY IN NOVEMBER.

It is unlikely that there will be many flowers remaining in the open this month, for the last of the Chrysanthemums and Dahlias will have succumbed to the weather ; but there are many trees and shrubs still carrying coloured foliage or crops of berries, some only now reaching their best, and the collections of tender plants in the greenhouses will, as usual, include some things of interest.

Winter-flowering shrubs are prominent in the Temperate house. Camellias are among the most showy, and the first of these are *C. saluenensis* and *C. Sasanqua*. The former is represented here by a large-flowered, bright pink form, the latter by a white, rose-flushed variety known as var. *fragrans*, although it has no appreciable odour. A pink variety of *C. Sasanqua* growing on Battleston Hill usually comes into bloom during the late autumn, although the weather is unfavourable to such precocity.

Two Buddleias which require the shelter of the house are *B. tubiflora*, a bushy plant whose leafy, orange spikes develop in an almost endless succession, and *B. madagascarensis*, a silvery-leaved plant of much more rampant growth, whose flowers, of similar colouring to the other, are now appearing in lax panicles. One of the most striking plants here is *Tibouchina semidecandra*, which combines the beauty of large, violet flowers, crimson-stained bracts and bold, velvety leaves of deep green. Some other ornamental shrubs due to flower this month are *Epacris impressa*, with long spikes of waxy, pink bells, the deeper red *E. ardentissima*, *Erica canaliculata*, whose downy branchlets are closely set with innumerable pearl-white blossoms, *Barosma lanceolata*, with narrow, aromatic leaves and neat, white sprays, and *Abutilon insigne*, whose crimson-veined bells hang from leafy growths trained near the glass on the east side of the house. Pot plants of many varieties of Fuchsia will also be in evidence.

In the Half-hardy house the first deep blue flowers are appearing on *Lithospermum rosmarinifolium*, a useful sub-shrub which continues in bloom until March. *Calceolaria Pavonii*, one of the most robust members of this large genus, has stout stems reaching to the top of the glass, with leaves and panicles of yellow flowers in proportion. On the opposite side *Clematis cirrhosa* is producing pendent, creamy-white blossoms followed in due course by silky-plumed seed heads. Of the many bulbous plants in this house the hybrid Nerines are the brightest at the present time, and are apt to overshadow smaller and less vividly coloured plants such as *N. filifolia*, a very pretty grassy-leaved species with frilly, pink flowers, *Tulbaghia pulchella*, a South African bulb with long-stalked, mauve umbels, *Cyrtanthus lutescens*, from the same region, but yellow-flowered, and *Narcissus Panizzianus*, one of the smaller Tazetta forms from the Riviera.

The Azalea garden, a short distance from the greenhouses, is still brightened by the fading leaves of Azaleas and Viburnums, a tall Tulip-tree clad in clear yellow for a short time, and various Berberises, including the original plant of the large-fruited *B. rubrostilla*. In the Award of Garden Merit collection some early blossoms may be found among the bronze-tinted leaves of the large specimen of *Viburnum fragrans*; and two other good things here are *Cotoneaster rotundifolia*, a Himalayan species whose large red berries remain on the nearly leafless branches all through the winter, and *Crataegus Lavalleyi*, a small and shapely tree, white flowered in May and now bearing plentiful orange fruits.

The visitor will find the most pleasing autumn colouring in the Wild garden, where the bright hues of the deciduous North American Vacciniums, including *V. virgatum*, *V. pennsylvanicum* and *V. corymbosum*, together with the related *Pieris Mariana* and a stately specimen of *Oxydendrum arboreum* contrast agreeably with the varied green of the Rhododendrons; above which, at the east side, towers the fiery head of a Liquidambar.

In Seven Acres many of the shrubs mentioned in our notes for October will still be in good condition, and others may be added to the list. Some of the late-ripening Cotoneasters, like *C. serotina* and *C. lactea*, are becoming more conspicuous, and *Stranvaesia Davidiana*, with pendent bunches of rich red berries and some of the older leaves similarly coloured, is particularly handsome. The strong-growing *Celastrus orbiculatus* is an excellent climber for covering an old tree or shed, or, as in Seven Acres, allowed to ramble over a tall hedge of Rhododendron. As its yellowing leaves fall, so the little three-parted capsules open to expose scarlet-coated seeds. Branches cut in this condition and kept in water remain fresh for several weeks. In mild spells of weather the first flowers open on the leafless branches of *Prunus subhirtella* var. *autumnalis*, but a more liberal display usually comes in early spring.

In the Rock garden there are still flowers on the later Gentians, *Saxifraga Fortunei* and *Schizostylis coccinea*, and belated blossoms linger on some Geraniums, Polygonums and some other plants. The grey-foliaged plants, such as the Achilleas, some Saxifrages and *Lupinus ornatus*, have an added value now that flowers are scarce, and a touch of colour is provided here and there by the smaller ever-green shrubs, *Pernettya mucronata* with red, pink or white fruits, *Skimmia Fortunei* with clustered scarlet berries, and the glossy-leaved *Sarcococcos*.

GARDEN WORK.

REMINDERS FOR NOVEMBER.

Vegetable Garden.—Should the final earthing of Celery have been delayed this operation should be completed at the first opportunity. A little soil drawn up to the stems of Spring Cabbages will provide extra protection during periods of severe frost. Continue to remove decaying leaves from green crops. Collect sound Tomato and Runner Bean stakes and store in a suitable place for use next season.

For next year's cropping prepare a plan of the various plots in the vegetable garden. From now on take advantage of every opportunity to double dig and manure ground in readiness for those crops which benefit from such treatment. Good results can be obtained from ridging very heavy soils for the purpose of exposing as large a surface as possible to the influence of the weather. Usually ground which has been cleared of crops and on which it is intended to grow winter greens during the coming season, such as Brussels Sprouts, Kales and late Broccoli, is better left undisturbed. The present is a good time to lime ground where this is considered necessary; apply as a surface dressing immediately digging is completed. Basic Slag and Kanit are manures best applied during the next two months.

In favoured localities make a sowing of Broad Beans and a round-seeded Pea on a south border. Good results from these sowings are much more certain where cloches are available to cover the plants during spells of extreme wintery conditions.

Lift Chicory, Rhubarb and Seakale roots in readiness for forcing; prepare root cuttings of the last named which should be stored in sand and placed in a cold frame or sheltered position until planting time next spring.

Protect curds of Cauliflowers against damage by frost; where deep frames are available the mature plants can be lifted and placed close together in a frame where, if given plenty of air, they will remain in good condition over a long period.

It is important that all vegetables and fruits in store should be inspected periodically during the winter months. It is work which can be conveniently carried out during spells of bad weather when it is impossible to work in the open. Remove all specimens which show the least sign of decay; those slightly infected can be put on one side for immediate use.

Fruit Garden.—Early in the month is considered the best time to plant fruit trees and bushes, provided the soil conditions are favourable. A word of warning is necessary with regard to the practice of planting fruit trees too deeply, especially stone fruits. Take care that trees are not planted deeper than they have been growing in the nursery; the soil line is usually visible on the stems of the trees. It is of the utmost importance to stake and tie the trees securely at planting time wherever this is considered necessary, making allowance for the tree to settle; there should be no chafing of the tree's bark.

Should it be necessary to replenish stocks of bush fruits the present is a good time to insert cuttings of Black and Red Currants, also Gooseberries, provided the stocks are clean and the varieties worthy of propagation. Bushes of these fruits raised in a similar manner last autumn will now be ready for transferring into their permanent quarters.

Take advantage of favourable weather to prune Apple and Pear

trees needing this treatment, also Gooseberries and Red Currants except in those districts where birds are known to remove the buds during the winter, in which case the pruning of the later fruits is better deferred until late February. At pruning time it is essential to remove and burn all dead and diseased spurs as an aid to the control of Apple and Pear Scab, also Brown Rot. Information regarding pruning can be found in the pamphlet entitled "The Pruning of Hardy Fruit Trees," obtainable from the Secretary of the Royal Horticultural Society, Vincent Square, Westminster, S.W. 1.

In all except the most southern parts of the country it is advisable to protect Fig trees growing on walls before the end of the present month. A covering of spruce boughs or similar material is recommended for this purpose.

Complete the gathering of late Apples and Pears and keep a watchful eye on those fruits already in store.

Flower Garden.—The early part of the month is usually the best time to plant hardy deciduous trees and shrubs including Roses, which soon become established before the severe weather sets in and do not suffer nearly so much from drought the following summer as do those planted later.

Plant Tulips and complete the planting of other hardy bulbs as soon as possible. The present is also a good time to divide and replant Lily of the Valley.

Stock plants of early-flowering Chrysanthemums should be lifted this month and placed in a cold frame for protection.

Take advantage of mild spells of weather to prune and retrain hardy climbers growing on walls and trellis.

By the end of the month all shrubs and climbers of doubtful hardiness should be protected; small branches of Conifer and dry bracken can be useful for this purpose. At the same time provide winter protection for the crowns of Eremuri and Gunneras.

When clearing away the stems of herbaceous plants and like material together with fallen leaves, do not burn but transfer to the compost heap, as garden compost is usually much more valuable than ash in the average garden.

Where worms are troublesome in lawns choose mild weather and apply a worm killer. Most lawns will benefit from periodical spiking during the winter months provided the soil conditions are favourable for this operation.

Cold Greenhouses and Frames.—From now onwards during the winter months, plants in cold greenhouses and frames require very little water, on the other hand they should not be allowed to suffer from excessive dryness of the roots. Ventilate the structures whenever outside conditions permit. Remove decaying leaves from plants growing in frames and occasionally stir the soil between them with a pointed stick. Covering material for frames should be kept in readiness in case of severe frost; sheets of newspaper laid over plants in unheated houses help considerably in preventing frost damage.

The present is a good time to effect any necessary repairs to frames and the cleansing of both houses and frames can usually be carried out more conveniently at this time of the year. Washing the glass both inside and out and whitewashing brick walls, besides being hygienic, will ensure maximum light reaching the plants.

Continue to examine bulbs growing in bowls, etc., and transfer to cold frames at the stage as advocated in the previous notes,

To provide a continuous supply of leaves throughout the winter months it is advisable to place a frame or cloche over a patch of Parsley sown for this purpose in the open garden, unless provision has already been made by making a sowing direct into a cold frame.

Begin to introduce small batches of Chicory, Rhubarb and Seakale into unheated houses for the purpose of forwarding, placing beneath the stages and excluding all light by suspending sacking or similar material.

Blanch Endive by excluding all light from the plants. To provide this salad over a long period, small batches should be treated in succession.

The leaves will now be falling from Peach and Nectarine trees growing in cold houses; these should be gathered periodically and destroyed. Admit the maximum ventilation to rest the trees and endeavour to ripen the shoots thoroughly. On no account accommodate other plants in the house which would require the ventilators to be closed or the temperature raised to high levels.

All the fruit from Grape Vines should be removed by this date and maximum ventilation should be given in order to rest the vines. Where sub-lateral growth has been allowed to develop this can be cut off with the object of affording maximum light and air to the laterals to enable them to become thoroughly ripened. Do not prune the laterals until all leaves have fallen. The same remarks apply here as in the case of Peach houses regarding the housing of plants and high temperatures.

EXPERIMENTS WITH DRIED POTATO EYES.

By J. RAINE.

THE article in the R.H.S. JOURNAL for May on the growing of Potatoes from dried eyes led to the following. I looked about and found seventeen midget seeds left from the planting of some 'Arran Pilot' and 'Duke of York.' An eye in each had developed a promising bud. Together they weighed $8\frac{1}{2}$ ozs. I pared off the buds with the minimum of skin attached. They weighed $\frac{3}{4}$ of an ounce. As the buds were so far advanced I did not keep them more than 24 hours. I planted them (May 10, almost four weeks after the main crop) as suggested, 4 inches deep, and 12 inches apart, in a strip of soil that had not been dug since November, and not manured since the winter before that. I loosened the soil with a fork but did not turn it over. Every bud grew. The plants were kept clean and earthed up. They had no fertiliser from start to finish.

On August 2, as there were signs of blight, they were dug, and weighed by a neighbour. They weighed 42 lb., of which 37 were first-class ware, decidedly superior to the ware from the general crop. Further, the midget eye crop was produced in a month's less time.

For the sake of comparison, I dug and weighed the first seventeen roots, in a line, of the general crop. The result was $36\frac{1}{2}$ lb.; 42 lb. from $\frac{3}{4}$ oz. *planted seed* makes one inclined to make further tests along similar lines.

THE EFFECT OF ARTIFICIAL FROST ON SEED GERMINATION.

By DR. MAURICE AMSLER.

It has long been known that germination of seed of many species is accelerated and increased by the advent of frost and also probably of snow. Especially is this the case with the minute seeds of *Primula*, *Meconopsis* and *Gentian* and it is chiefly with these genera that my few experiments are concerned. Whenever possible the seed should be sown absolutely fresh, a counsel of perfection easily carried out with home-saved seed, but the snag appears when one purchases imported seed or packets from the trade; here freshness cannot be guaranteed and the seed may arrive in the spring or summer, when even in our climate we cannot guarantee a really hard frost.

Having had many such disappointments with seed which came to hand when autumn and winter were past, it occurred to me that a little deception might cause the seeds to imagine they had undergone these two seasons underground, if only for a very short time.

The *modus operandi* was as follows:—The seeds were put into a small vessel with a teaspoonful or two of water and kept fairly warm, anything from 70°–100° for 24 hours. I have utilised a linen cupboard and a sunny shelf in a greenhouse: the former is probably preferable, the heat being more constant. This stage, I suspect, corresponds with what is usually known as “vernalisation,” but personally I like to look upon seed which is no longer “green” as being desiccated and to feel that it has a good drink during its warm bath.

Freezing is the next step—the pot of seed is placed in the icebox of the domestic refrigerator for another 24 hours whence it emerges, of course, as a solid block of ice. This soon melts; as much as possible of the water is drained off; what remains together with the seeds is mixed with dry sand which is forthwith broadcast on a prepared seed pan and covered or not as the spirit moves you.

My method with small seeds such as *Gentiana verna*, *Meconopsis*, etc., is to surface the seed pan with very fine gravel or broken brick rubble put through $\frac{1}{8}$ -inch sieve, sow the seed thereon and just water it in with a fine-sprayed syringe; no further covering is necessary the seeds having been washed down between and below the surfacing of stones where they remain until they germinate. Moreover there is little danger of their being carried to one or other side of the pan should anyone water them carelessly or excessively.

My first freezing experiments were made some fifteen months ago with seed of *Meconopsis betonicifolia* var. *pratensis*. The month was May and I had not great hopes of a successful crop of seedlings; it was this doubt which suggested freezing before sowing—and the result was very encouraging. Germination took place in less than a month and was so profuse that I pulled up many of the seedlings lest they should damp off from overcrowding. At the time of sowing a single line of untreated seed was thickly sown in the same pan and not a single one germinated.

The same species treated in the same way this year gave much the same result, but a few of the control seeds did come up. In June, of this year I received a packet of seed of *Primula* × ‘Itton Court,’

a hybrid of *Primula Cockburniana*. With the same method I got a very satisfactory crop of seedlings in less than four weeks; there the controls were few and far between and also considerably later in appearance. Finally to revert to *Gentiana verna*. It has been my habit to sow a crop of this little Alpine each summer for many years past. June or July sown seed has never shown up before the following March or April. This year I was a little later than usual, actually mid-July, so I froze the seed before sowing, and to my intense surprise have found a few seedlings coming up five weeks later. Perhaps it should be mentioned that a strong watchmaker's glass was necessary for this discovery.

I have lately found that I am by no means the first in this field of experiment. Among others Messrs. MELVILLE and METCALFE of Kew have made much more scientific research on the germination of *Belladonna* seed; the period of refrigeration at about freezing point varied from 3 to 14 days, but it is likely that a large seed such as that of *Belladonna* may require longer treatment, more especially as it has a thick shell or theca for which scarification was tried in some cases.

Mr. METCALFE tells us that the process is probably biochemical, and not physical, *i.e.*, not due to the bursting of the theca by expanding ice as many of us had thought.

EMBOTHRIUM COCCINEUM FORSTER.

By W. BALFOUR GOURLAY.

SOME weeks ago, at one of the R.H.S. Shows, a number of exhibitors showed specimens of *Embothrium coccineum*. These differed considerably in the shape of the leaves and shade of flower colour, though all were labelled *Embothrium coccineum*. It is evident that the plant occurs in two or more forms or subspecies. A narrow-leaved form is sometimes described as "*Embothrium lanceolatum* of Ruiz and Pavon." W. J. BEAN, in his *Trees and Shrubs Hardy in the British Isles*, does not mention *E. lanceolatum*, perhaps as being insufficiently distinct from the type, or perhaps as not hardy. Of *E. coccineum* he writes: "Only suitable for the mildest parts of our island, such as Cornwall and S.W. Ireland." *The Botanical Magazine* for 1855, on the other hand, in the article which goes with their figure t. 4856, states that "while *Embothrium lanceolatum* of Ruiz and Pavon is not found north of Concepcion, our present beautiful species (*E. coccineum*) is chiefly confined to the Straits of Magellan and Tierra del Fuego, not, however, reaching Cape Horn. It might be expected then, as it proves, to be quite hardy in this country. ERNESTO MALDONADO, a former official in the Chilean Ministry of Agriculture, writing about *Embothrium Coccineum* in his *Tratado de Arboicultura Forestal y de Adorno* (Tomo II), states: "This tree grows wild from the province of Curico to that of Magallanes."

When I was in Chile with Mr. CLARENCE ELLIOTT, nearly twenty years ago, we saw *Embothrium* in flower near Temuco, and in fruit in S. Patagonia, neither site being at any great elevation. The flowering specimens had very wide leaves.

Specimens of Chilean *Embothriums*, in the Cambridge University Herbarium, are from the following sites: *E. coccineum*—3 sheets from

Valdivia, one from Port Famine ; *E. lanceolatum*—1 sheet from Valdivia and one from Cirnelillo. A specimen from Arique has had its name altered from *E. coccineum* to *E. lanceolatum*. (Arique is a small village near Calle-calle, on the river of the same name, some twenty miles or so upstream from the town of Valdivia. I have been unable to locate Port Famine or Cirnelillo.)

It is evident that there are at least two rather similar forms of *Embothrium* in Chile, and there may be more than two. That might explain the different account of *Embothrium*'s hardiness, in the literature and in the horticultural experience of Lord ABERCONWAY and Commander F. GILLILAND.

FRUIT GROUP EXHIBIT.

At the Show on September 11, 1945, seventeen members of the newly constituted Fruit Group sent exhibits of Dessert Apples and other fruits in season ; included in these were : twenty-six varieties of Dessert Apple, five of Cooking Apple, three of Pear, five of Plum, six of Damson, three of Bullace, one Peach, one Nectarine, one Melon, one of Red Raspberry and one of Yellow Raspberry. Owing to the vagaries of the weather many of the Apple varieties were shown out of their normal season, if we define the term "in season" to mean the period during which the variety can be used for the purpose for which it is grown. Of the culinary and dual purpose varieties shown, 'Stirling Castle,' 'Duchess of Oldenburg' and 'Warner's King' could fairly be regarded as "in season," but 'Norfolk Beauty' (October–December) and 'Newton Wonder' (till March) could not.

East Malling Research Station sent an interesting collection of Damsons and Bullaces, but this did not include specimens of the Shropshire, Cheshire and Westmorland Damsons ; it would be interesting to have specimens sent another time, to see how far these famous varieties vary in their native counties.

Lord LECONFIELD sent an interesting collection, including a handsome Red Raspberry, 'Queen Alexandra,' and a beautiful plate of the Yellow Raspberry 'Golden Hornet.' Mr. TOM NEAME's plate of the new Apple 'Sunset' was much praised by the visitors, and East Malling Research Station showed two attractive new seedlings, one a cross between 'Worcester Pearmain' and 'Macintosh,' and the other a cross between 'Cox's Orange Pippin' and 'Ellison's Orange.'

Whether Apples should be polished or not for the show bench is a question which might usefully be discussed at some future meeting of the Fruit Group. One youthful visitor to the Show was heard to exclaim, pointing to the exhibit of a peer of the realm : "'E 'asn't shined 'is up."

N. B. B.

THE VEGETATIVE PROPAGATION OF FLOWERING TREES AND SHRUBS.

By F. P. KNIGHT.

(Lecture given on Sept. 11, 1945; Major Pam in the Chair.)

THE propagation of trees and shrubs had to be almost entirely abandoned during the war years in favour of raising essential food crops, with the result that much leeway has to be made up. The following account of Vegetative Propagation is presented in the hope that it will assist towards increasing stocks of flowering trees and shrubs, using other means than raising these from seeds.

It is well known that it is useless trying to reproduce truly trees and shrubs of hybrid origin, or of garden forms, from seeds; they must be propagated by layering, rooting cuttings, budding, or grafting, using whichever method is appropriate. The experienced propagator knows exactly what to do and when to do it, and is usually provided with suitable equipment for the work. The amateur or layman is not so fortunate, and for that reason there is always the danger that some desirable plant may be either altogether lost to cultivation or fail to become distributed.

It is considered most convenient to present the subject by first describing the more simple methods of increasing plants by Division, and then passing on to Layering, and from that to the more difficult and artificial practices of inserting Cuttings, Budding and Grafting.

DIVISION.

Raising plants by division is usually associated with herbaceous subjects, but several shrubs can be increased by merely removing portions which have rooted naturally. Typical examples are *Kerria*, *Symphoricarpos*, certain *Spiraeas*, and *Hypericum calycinum*. The parent plants can be lifted during the normal transplanting season, and divided to form several new plants, or suitable rooted portions, e.g. suckers, can be severed, leaving the parent plants in their original positions. Closely allied to this method is that known as stooling, where the stems are actually buried in mounds of earth in the summer months, and can be removed during the following winter with well-developed root systems. This method is used to produce large quantities of fruit tree stocks, and to my knowledge has never been fully exploited among flowering trees and shrubs. The general appearance of mounded-up rows of stools, as they are called, is not unlike that of ridged Potatoes. A well-managed stool bed will remain productive for many years.

LAYERING.

This undoubtedly provides one of the most reliable and trouble-free methods of increasing a very wide range of trees and shrubs, and is particularly suitable for the amateur who wishes to propagate a few plants without actually sacrificing the parent. Examples of natural layering in woodlands and hedgerows are frequently seen, and the ease with which brambles increase by tip-layering, as it is called, is familiar to most gardeners.

Much has been written about layering, and yet it is still unusual to see this well done in other than commercial establishments. The most frequent mistake made by amateurs is that of trying to layer branches which are too large, in the mistaken hope that a mature plant will be quickly obtained. On the contrary, it will be found that thick stems usually take a long time to produce new roots, and the resultant plants, when eventually separated from the parent, are often little more than shapeless rooted branches, showing little promise of ever being trained into good specimens. I have demonstrated this fact on many occasions, and a visit to inspect layering in any tree and shrub nursery will provide convincing evidence of the wisdom of layering small branches. The object should be that of producing young, vigorous, shapely plants with the roots as near as possible in line with the growing tips; this is particularly desirable when raising trees.

The season for layering is generally during late September and October, and again in March and April, preferably the former, but it can be successfully practised during open weather throughout the winter months. It is best to dig over the ground into which the stems are to be buried, and the building up of mounds of earth which tend to dry out should be avoided. A builder's trowel which has had the point cut off is an ideal tool for layering, and is largely used by nurserymen for this purpose.

It is not possible to give specific details of the length of stem to be layered, as this will vary from a few inches for such plants as dwarf Rhododendrons, up to portions from 1 to 2 feet long for Magnolias, Lilacs, etc. Select if possible young, clean, unbranched growths, and bend these so that they resemble a bent elbow, then bury them firmly in the soil, leaving the tips sticking out of the ground as nearly vertical as possible. This elbow joint is doubly important: it restricts the ready flow of the sap from the parent plant to the end of the layered branch, and so encourages root production, and ensures the formation of a shapely young plant. If no elbow joint is made, the growing tip of the buried layer can continue to receive sustenance from the parent without interruption, and the production of roots is considerably delayed. Generally speaking, it is unnecessary to remove a portion of the bark from the buried stems, nor in fact to use artificial means such as twisting wire around the branches, but a sharp quick twist of the stem, in order to crack the skin at the time of layering, is helpful. If the layers are properly firmed, no pegs are needed to keep them in position, and these are very rarely used by nurserymen. It is wise after a period of very hard frost to examine the layers, and replace any which may have become dislodged. Where it is necessary to use an older branch, which may have become brittle, it is a good practice to layer this on a warm day, when it will be found that the wood is more pliable.

No general information can be given about the length of time required for layered branches to produce sufficient roots to enable them to be severed from the parent plant and become independent, but layers of most shrubs put down in the autumn may be severed during the following autumn, when they may be either transplanted or allowed to remain during the winter and moved in the early spring.

So far my remarks on layering have been mainly for those who do not wish to sacrifice a whole plant to obtain quantity, but merely wish to propagate a few young plants. The commercial method is

considerably different, and the setting out of a layering bed constitutes a normal nursery practice.

The parent plants, or stools as they are sometimes called, are brought together and planted in a large bed, spaced widely apart so that every available branch may be layered, cutting out those which are unnecessary. A skilfully managed layering ground is well worth seeing, and is relied upon to provide large quantities of first-class trees and shrubs, too numerous in variety to mention. It will be noticed that while one set of branches is layered another crop of very strong clean young shoots develops from the centre of the parent plants; the simple act of bending down the layered branches is responsible for the exuberant growth of these new shoots, which are ideal for layering and are used in turn after the previous crop of rooted layers is removed. Stool plants will last for many years.

Many thousands of Rhododendrons are raised by nurserymen every year from layers, but owing to the nature of the wood making it difficult to bend the branches as easily as such deciduous plants as Lilacs, the parent plants are usually planted on their sides, so that the tip of every branch can be used. It is important when dealing with these thoroughly to soak the ball of roots before layering, for if buried in a dry condition the results will be poor. To see a large area of layered Rhododendrons in bloom with their trusses of flowers forming a highly coloured pattern on the ground is a sight not easily forgotten. The layering of dwarf Rhododendrons of the Lapponicum and allied series is largely practised, and I have raised large quantities by merely working in suitable soil among the short twiggy branches and making this firm, while in the West of England, where the rainfall is high, it was only necessary to place stones on the branches, which soon produced sufficient roots to give young plants. In order to try to increase a good form of *Magnolia mollicomata* a heap containing many cubic yards of soil was built up in order to reach the nearest branch, but this procedure called for constant attention to watering in the summer months.

Another method of layering is that practised for Heaths. There does exist a prejudice against such plants being raised by layering, but there is no justification for this if the work is properly done. The fact remains that some very straggly and badly rooted plants are sold, mainly as the result of pulling apart old worn-out plants. I have raised thousands of first-class plants by selecting normal three or four year old parent plants, and planting these deeply in narrow trenches so that only about an inch of their shoots shows above the ground; a mixture of sand and peat is worked in among the twiggy branches and made firm. This work is done in the early autumn, and in less than a year masses of roots have been developed; a very sharp spade is then used to cut through the newly rooted young shoots just below the roots, and several of these are then bunched together to form one plant and planted in nursery beds.

It is essential to keep the layering beds free from large weeds, as the removal of these may dislodge the layered branches.

PROPAGATION BY CUTTINGS.

From the commencement of my horticultural career no other branch of gardening has fascinated me as much as the raising of trees and shrubs from cuttings. An ambition which I hope to realize

is that of building to my own design a thoroughly efficient propagating house in which cuttings will be given the best possible conditions in which to root. It must be admitted that in many establishments only make-shift arrangements are provided for this purpose, presumably with the mistaken idea that cheapness is synonymous with economy. Raising plants from cuttings varies from all other methods of propagation, by reason of the necessity of keeping the portion of the plant which constitutes the cutting alive for a sufficient period to form new roots. It is for the conservation of the moisture or sap in the cuttings that specialized propagating frames, bell glasses, or hand lights are required.

Although there are peak periods in the year for the insertion of cuttings, it cannot be said that there is any close season, neither can any rigid time-table be laid down governing all districts. Experience soon shows that cuttings successfully rooted at a particular period in, say, the western counties, fail to respond if inserted at exactly the same time in the east or north. I think it can safely be said that skilled propagators possess an instinct which can be relied upon to decide just what type of cutting will succeed, and the precise time of the year when this should be taken. This knowledge is practically impossible to impart.

Hard Wood Cuttings inserted out of doors.—I have stated that there is no close season for the insertion of cuttings, and in order to outline the seasonal operations it will perhaps prove most convenient if those methods which do not demand the use of frames or similar equipment are described first. The simplest form of raising trees and shrubs from cuttings is that of making these from the fully ripened wood in late autumn or early winter. Typical plants so raised are: Red-stemmed Dogwood, Tamarix, Flowering Currants, Poplars and Willows. Cuttings are made of the current year's growth about 8 to 10 inches long, in some cases with a heel of the previous year's wood. These are inserted in open nursery beds, and buried to about three-quarters of their length and made firm. Where heavy soil prevails a scattering of sand can be incorporated around the base of the cuttings at the time of insertion, but generally speaking this is unnecessary. No attention is normally required except that of keeping the bed free from weeds, and re-firming any of the cuttings which may become dislodged by frost. If considerable quantities are required the cuttings are planted in lines spaced about 1 foot apart, allowing, say, 4 inches between the cuttings. About a year from the time of inserting the cuttings they should have developed sufficient roots to enable them to be transplanted.

Large numbers of other plants, such as *Senecio laxifolius*, Lavender, and Forsythia, may be raised in open beds, but the cuttings are made shorter than those described above. Instances are always being brought to my notice of trees and shrubs being raised from cuttings inserted in outdoor positions, which in general commercial practice are given the protection of a frame or bell glass, and furthermore, types of cuttings are sometimes selected which do not resemble those which a skilled propagator would use. These examples prove that it would be foolish to be dogmatic about precise rules.

Cuttings in Bell Glasses, Hand Lights and Cold Frames.—The possession of bell glasses, hand lights, and well-built cold frames provides for the propagation of an endless variety of trees and shrubs from cuttings, and in certain districts no other equipment is used.

The season generally for filling these is during the late summer and autumn months, when the current year's wood is becoming ripe.

Where several bell glasses or hand lights are used it is usual first of all to prepare a cutting bed by providing a mixture of sandy soil in which to place the cuttings. For general purposes a light loam to which has been added a liberal sprinkling of good quality clean sharp silver sand is sufficient, but for *Ericas* and similar plants the addition of clean fine peat moss is recommended. I do not favour using leaf mould, as this may promote the growth of troublesome fungi.

A sheltered position away from the glare of the sun is preferable, and the soil should be from 4 to 6 inches deep; this should neither be wet nor dry at the time of inserting the cuttings, but just sufficiently moist to be made firm. The bell glass or hand light is pressed on to the surface of the soil so that its shape is clearly outlined, and a sprinkling of dry silver sand then spread evenly within this shape; the cuttings are then dibbled in, when it will be found that grains of sand will fall down around the base of the cuttings. Care must be taken to ensure that these rest on the bottom of the holes without leaving any air pockets.

Among the many plants which are very successfully increased in bell glasses, etc., are *Berberis*, *Cotoneasters*, *Double-flowered Gorse*, *Genista hispanica*, *Brooms*, *Escallonias*, *Pyracanthas*, *Rosa* spp., evergreen *Ceanothus*, etc., while in the peaty soil *Ericas*, *Pernettyas*, *Vacciniums*, *Gaultherias*, certain *Rhododendrons*, and evergreen *Azaleas* are easily raised.

In nearly all cases the cuttings are made of the current year's wood about 3 inches long with a heel of the previous year's wood, except for *Ericas*, which are only about 1 inch long and need not have the heel in all varieties. It is essential to insert the cuttings firmly, and they should usually be given one good watering to settle them in. The subsequent treatment is very simple; the leaves which are cast should be removed, but otherwise it is rarely necessary to lift off the bell glasses until the days lengthen in late February; air may then be gradually admitted; this can be done by just propping up the edges of the glasses for a short period, until finally in April they may be removed altogether, and the rooted cuttings either potted or left until the early autumn, when they may be safely transferred to nursery beds. Care should be taken to keep moles from burrowing under the cutting bed.

If bell glasses are not available, cuttings may be rooted in improvised frames made of boxes, which have had the bottom boards removed, so that the sides may be pressed down into the soil for about 1 inch, and the tops covered with well-fitting panes of glass. For very small quantities of cuttings inverted glass jam jars may be used. Large quantities of easily rooted cuttings may be inserted in sandy soil in cold frames, but these should have well-fitting lights and be shaded if used in the summer months.

Warm Propagating Frames.—The construction of a propagating frame with the provision of bottom heat will be well repaid by the successful raising of many trees and shrubs which prove difficult under cold treatment. The usual type of frame is built of brick with a slate bottom, and covered with well-fitting hinged lights, and for efficient management the frames should not exceed 3 feet 6 inches in width. Under the slates are two hot-water pipes which maintain a temperature in the propagating media of approximately 60° F.

The slate bottom should be sufficiently strong to carry the weight of silver sand to the depth of 6 inches. If possible, where it is proposed to insert the cuttings directly into the frame it is best to divide this into sections, filling one with pure sand and another with a mixture of sand and peat moss; a third could be filled with loose peat moss into which pots of cuttings may be plunged. Good silver sand can be used for several successive crops of cuttings if it is occasionally washed, and any appearance of greening on the surface can be checked by watering with a weak solution of permanganate of potash.

The peak period of usefulness of the warm frame for cuttings of deciduous trees and shrubs is from the beginning of June to the end of August, after which it will generally be found that the current year's wood of most kinds is too ripe for this treatment. From September until December cuttings of a wide variety of evergreens may be struck.

The choice of cuttings for a warm frame is usually that of young or half-ripened shoots of the current year's growth, varying from $1\frac{1}{2}$ to about 4 inches in length, made generally without a heel of the older wood, but this depends on the actual variety of plant being used. It would be difficult to give a precise table showing which plants are more successful with a "heel cutting," but as a guide those possessing a large pith are best made with a heel.

Wherever possible cuttings should be taken from young plants, but care should be taken to avoid using thick, over-vigorous shoots; normal growths without flower buds succeed best, and often the young tips should be cut off to prevent wilting. The exact condition of the wood for rare and difficult plants is most important, and experienced propagators appear to know instinctively just what type of cuttings to select. To set such knowledge down in the form of a time-table would be impossible, and as the result of considerable experience of propagating in the rainy climate of Devonshire, and the varying conditions of Edinburgh, Kew, the Midlands and East Anglia, I can very definitely state that it is not a matter of inserting cuttings at a certain date, but to do this when the growth of the plant is right. Often a rare plant is searched in vain for suitable cuttings, and sometimes it is possible to induce these to grow by cutting back a shoot, so that young wood is produced. Occasionally, too, suitable cuttings can be obtained by pinching out the tips of soft shoots while these are still growing on the parent plant; the base of the shoots then left are actually fit to take about a week or ten days later. Another method of producing young shoots for cuttings is to pot up stock plants, and transfer these to a warm greenhouse in the spring, where they are regularly syringed. This treatment is very successful in providing suitable cuttings of *Ceratostigma Willmottianum* and *Prunus triloba* fl. pl.

The making of cuttings requires the use of a sharp knife, and the extent to which leaves should be removed is a controversial subject. Some propagators remove these from as much as two-thirds of the length of the cuttings, and others only on the actual portion of the stem which is buried. Some reduce the size of the leaves left on the cuttings, and others prefer to leave these intact. I generally practise only removing the leaves on the portion to be inserted, and reduce the size of large leaves.

Cuttings of many plants root quickly in a warm frame. Forsythias, for example, are fit to pot within a fortnight of the date of insertion,

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

JULY 24, 1945.

FLORAL COMMITTEE B.—Lord ABERCONWAY, C.B.E., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of Lilies and other hardy flowers.

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of hardy shrubs.

To Mr. K. W. Harle, Lower Basildon, Berks., for an exhibit of succulents

To Messrs. Hillier & Sons, Winchester, for an exhibit of hardy shrubs.

To Orchard Neville Nurseries, Baltonsborough, Somerset, for an exhibit of rock garden plants.

Flora Medal.

To Messrs. D. Stewart & Sons, Ltd., Ferndown Nurseries, Dorset, for an exhibit of Nymphaeas and other hardy flowers.

Award of Merit.

To *Hesperoyucca Whipplei* as a hardy, flowering shrub (votes 8 for, 0 against), from Lord Aberconway, C.B.E., V.M.H., Bodnant, N. Wales. See p. 340.

To *Malus* 'Simcoe' as a hardy, ornamental-fruited tree (votes 10 for, 0 against), from Iris Lady Lawrence, Springwood, Godalming. See p. 340.

Preliminary Commendation.

To *Lilium* × *princeps* Pink Variety as a hardy flowering plant (votes unanimous), from Col. F. C. Stern, O.B.E., M.C., Highdown, Goring-by-Sea, Sussex.

Other Exhibits.

Agapanthus africanus var. *Mooreanus*, exhibited by Col. F. C. Stern, O.B.E., M.C., Goring-by-Sea.

Amaryllis Ackermanni, *Eucryphia Billardieri* var. *Milliganii*, exhibited by Lord Aberconway, C.B.E., V.M.H., Bodnant, N. Wales.

Forms of *Athyrium Filix-foemina*, *Tigridia Pavonia*, exhibited by C. J. Howlett, Esq., Earley, Reading.

Campanula 'Peter Pan,' exhibited by Mr. E. Ladhams, Elstead, Godalming.

Erica vagans 'Lyonesse,' exhibited by H. Smith, Esq., Westcliff-on-Sea.

Hydrangea macrophylla var. *Mariesii*, *Salvia brachyodon*, exhibited by the Director, R.H.S. Gardens, Wisley.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and thirteen other members present.

Award Recommended:—

Award of Merit.

To *Cattleya* × 'Stalin' var. 'Victory' ('Angus' × 'Gloriette') (votes 10 for, 0 against), from Messrs. Sanders, St. Albans. See p. 339.

Other Exhibit.

Cypripedium × *Shillanum*, from Slade Betts, Esq., 100 Avondale Road, Bromley.

JULY 26, 1945.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and seven other members present.

Awards Recommended:—

Award of Merit.

To 'Constance Pullen,' as an exhibition variety (votes 7 for, 0 against), shown by A. G. Pullen, Esq., Findings, Wormley, Surrey. See p. 339.

Selected for trial at Wisley.

'Dawnlight,' shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.

'Constance Pullen,' shown by A. G. Pullen, Esq., Findings, Wormley, Surrey.

Other Exhibits.

'Miss Wardie,' shown by H. Chiswell, Esq., 8 Grierson Avenue, Wardie, Edinburgh.

'Zamba,' shown by J. Firth, Esq., 72 Listing Lane, Liversedge, Yorks.

'Sgt. Pilot Douglas Wheatley,' shown by G. A. Sprigg, Esq., 53 Southfield Lane, Whitwell, Worksop, Notts.

AUGUST 14, 1945.

FRUIT AND VEGETABLE COMMITTEE.—Mr. A. CHEAL in the Chair, and twelve other members present.

Exhibits.

Collection of fruits in season, from Lord Leconfield, Petworth Park, Sussex.

Apple 'Mitcham Wonder,' from Mr. C. H. Walkden, 8 Cecil Place, Mitcham, Surrey.

Apple 'Mrs. W. G. Lamb,' from Mr. G. Lamb, Rutland, Grove Park Road, Motttingham, S.E. 9.

Plum 'Apricot Gage,' from Mr. G. E. Dawkins, The Hoppet, Little Baddow, Essex.

Seedling Plum, from Mr. G. T. Malthouse, Harper Adams Agricultural College, Newport, Shropshire.

Seedling Plum, from Mr. R. G. Baker, The Quest, Yorkletts, Whitstable, Kent.

FLORAL COMMITTEE A.—Mrs. H. LINDSAY SMITH, in the Chair, and five other members present.

Selected for trial at Wisley.

Solidago 'Golden Early,' Solidago 'Golden Gate,' from H. Walkden, Esq., The Raft, Sale.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. G. W. LEAK, V.M.H., in the Chair, and ten other members present.

Award Recommended :—

Award of Merit.

To 'Egerton,' as an exhibition variety (votes 7 for, 0 against), shown by Mr. George Lamb, Egerton Nursery, Hextable, Swanley, Kent. See p. 340.

Selected for trial at Wisley.

'Egerton,' shown by Mr. G. Lamb, Swanley, Kent.

'Salmon Sweetheart,' shown by Messrs. J. and E. Maher, Carisbrooke Nursery, South Road, Hampton, Middlesex.

Other Exhibit.

'Phyllis Wilkinson,' shown by Mr. R. P. Wilkinson, Ivy House, Gomshall, Surrey.

JOINT DAHLIA COMMITTEE.—Mr. E. R. LUCKHURST, in the Chair, and four other members present.

Selected for trial at Wisley.

'Amber Queen,' 'Belle,' 'Butterfly,' 'Cease Fire,' 'Elfin,' 'Hawaii,' 'Lion,' 'Mackensie,' 'Radiance,' 'Rev. Chas. Craggs,' from Messrs. James Stredwick & Son, Silverhill Park, St. Leonards-on-Sea.

AUGUST 28, 1945.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. E. F. HAWES, in the Chair, and ten other members present.

Awards Recommended :—

Award of Merit.

To 'August Red' (votes 9 for, 0 against), 'Fair Maid' and 'Red Sweetheart' (votes 8 for, 1 against in each case), as exhibition varieties, shown by Messrs. J. and T. Johnson, Tibshelf, Derbys. See p. 340.



FIG. 97 HARD WOOD CUTTINGS OF *Spirea x Van Houttei* (left) AND *Cornus alba* (right)
(See p. 322)



FIG. 98.—ROOT PLANT OF *Colchysis fuciflora*.
(See p. 320.)



FIG. 99.—ROOT CUTTING OF *Rumex hybrida*.
(See p. 327.)



FIG. 100. TYPICAL SHRUB CUTTINGS ROOTED UNDER A BELL GLASS. *Cytisus* - *Bunka-odeti*, *Berberis* - *rubrostilla*, *Cotoneaster* *Wanda*, *Lesallonia* - *Levy*



FIG. 101.—SOFT WOOD CUTTINGS ROOTED IN A HEATED FRAME. *Philadelphus pekinensis brachybotrys*, AND *Callicarpa Geraldiana* (above), *Viburnum phlebotrichum* and *Forsythia spectabilis* (below).

(See p. 323.)



FIG. 102.—LEAF BUD CUTTING OF *Camellia japonica* var
(See p. 327.)

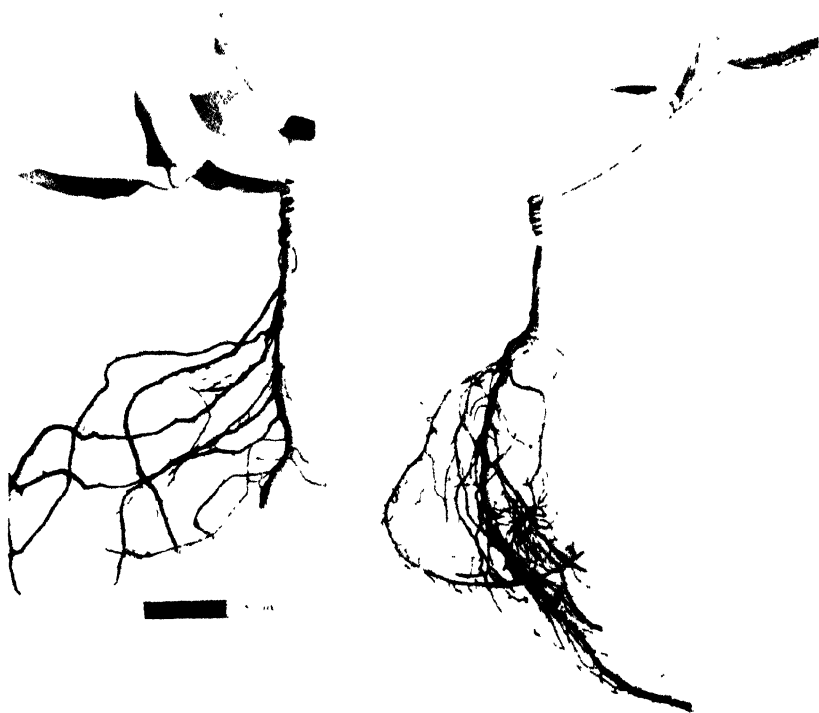


FIG. 103. GRAFT OF *Chimaphila Jackmanii* var. ON ROOT OF *C. vitalba*
(See p. 330.)



FIG. 104. GRAFT OF HYBRID LILAC ON ROOT OF *Syringa vulgaris*. GRAFT OF *Cytisus — Burkwoodii* ON TO STEM OF *Tolunum vulgaris*.
(See p. 329.)



FIG. 105 -- *Aesculus* \times *carnea* *Briottii* BUDDED ON TO THE COMMON HORSE CHESTNUT
(See p. 329.)

Selected for trial at Wisley.

'August Red,' 'Fair Maid' and 'Red Sweetheart,' shown by Messrs. J. and T. Johnson, Tibshelf, Derbys.

'Alfreton Yellow,' shown by H. G. Park, The Gas Works, Stanmore, Middlesex.

Other Exhibits.

'Butterglow' (A.M. 1939), shown by Mr. H. G. Park, Stanmore, Middlesex.

'Loyalty,' shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and seven other members present.

Selected for trial at Wisley.

'Commodore,' 'Glamorous,' 'Heron,' 'Kathleen Taylor,' 'MacArthur,' 'Midnight,' 'Minstrel,' 'Piebald,' 'Purple Emperor,' 'Tangerine,' from Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea, Sussex.

'Apiary,' 'Barbara,' 'Daily Delight,' 'Elizabeth,' 'Lila,' 'Russet,' 'Sun burn,' 'Tritoma,' 'Vicki,' from Messrs. Brown & Such, Ltd., Royal Berkshire Nurseries, Maidenhead.

Dahlias were also submitted by David Harris, Esq., Leicester House, Melksham, Wilts.

SEPTEMBER 11, 1945.**CACTUS AND SUCCULENT COMPETITION.**

The Silver Trophy, presented by Mrs. SHERMAN HOYT, for the best exhibit of Cacti or Succulents, staged by an amateur, was awarded to Captain Dunne Cooke, Carlisle Street, Soho Square, London.

FLOWER ARRANGEMENT COMPETITION.

The Silver Cup for the best Flower Arrangement by an amateur, was awarded to Mrs. Cyril Potter, Borough Green, Kent.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Red Apple.—Col. Denham sent a seedling Apple 'Pretty Marjorie,' raised by him at Kidlington by crossing a hybrid *Malus Niedzwetzkyana* × 'Northern Greening' with pollen from *M. micromalus*, itself a hybrid (*M. baccata*? × *M. spectabilis*). The fruit was conical and slightly ribbed, about 2½ inches high, highly coloured red all over and with red and white flesh; its colour fades to dark orange as the season advances. It has proved a fair early cooking variety. Col. Denham said that the flower was about 2½ inches across and bright rose without the bluish tinge noticeable in the flowers of most *M. Niedzwetzkyana* hybrids.

Blotched Gladiolus flowers.—Mr. G. W. Bowdles of Hampton Wick sent flowers of the Gladiolus varieties 'Picardy' and 'Van Simoven' with blotched perianth segments. The cause of the blotching was not evident, for it occurred on only a portion of the plants scattered among many others and was evident in the unopened bud. The flowers were referred to Dr. Kenneth Smith of Cambridge, as the blotching was very similar in appearance to that occurring in Freesias at times, which has been attributed to a virus.

FRUIT AND VEGETABLE COMMITTEE.—Dr. R. G. HATTON, V.M.H., in the Chair, and thirteen other members present.

Exhibits.

Collection of Vegetables, from The Director, R.H.S. Gardens, Wisley.

Collection of Carrots, from The Director, R.H.S. Gardens, Wisley.

Apple 'Caldecott Pippin,' from Mrs. D. M. Caldecott-Smith, Ockwells Manor, near Maidenhead.

Apple 'Highgate Pippin,' from Mr. Howard H. Crane, Highmead, Cheney Lane, Eastcote, Pinner.

Apple 'Higham Beauty,' from Mrs. D. I. Macdonald, Mill Farm, Higham, near Colchester.

Apple 'Beauty of Lincoln,' from Mr. H. W. Phillips, 29 Parker Avenue, Brant Road, Lincoln.

Apple 'Mitcham Wonder,' from Mr. C. H. Walkden, 8 Cecil Place, Mitcham, Surrey.

Apples 'Oxford Comrade,' 'Oxford Yeoman,' 'Peggy's Pride,' 'Red Army,' 'Jennifer,' 'Green Howard,' 'Eynsham Beauty,' from Mr. J. F. Wastie, Eynsham, Oxford.

lvi PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

- Seedling Apple, from Mr. J. W. Beal, North Ross Farm, Ellerton, Yorks.
 Seedling Apple, from Miss G. R. Vinson, Stanway, Closeworth Road, S. Farnborough, Hants.
 Seedling Apple, from Mr. S. J. White, 216 Footscray Road, New Eltham, S.E. 9.
 Blackberry 'The Bosham Thornless Blackberry,' from Dr. T. H. Godfrey, Fieldside, Bosham, Sussex.
 Peach 'Janet King,' from Mr. T. J. Lock, 19 Lansdown Road, Muswell Hill.
 Seedling Peach, from Mr. W. F. Argent, Howrah, Station Lane, Hornchurch, Essex.
 Seedling Plum, from Mr. F. Coney, 61 Victoria Road, Farnborough, Hants.
 Tomato 'Melville Castle,' from Messrs. Dobbie, & Co. Ltd., Edinburgh.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and nine other members present.

Awards Recommended:

Gold Medal.

To Mr. Stuart Ogg, Swanley, for an exhibit of Dahlias.

Silver-gilt Banksian Medal.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Dahlias.

Silver Flora Medal.

To Messrs. Baker, Ltd., Wolverhampton, for an exhibit of Otley Korean Chrysanthemums.

To Messrs. Brown & Such, Ltd., Maidenhead, for an exhibit of Dahlias.

To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

To Messrs. Waterer Sons & Crisp, Ltd., Twyford, for an exhibit of herbaceous plants.

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Dahlias.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Gladioli.

To Mr. R. D. Lainson, Piltdown, for an exhibit of Gazanias.

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of Gladioli.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of herbaceous plants.

Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for an exhibit of Carnations and *Dianthus Allwoodii*.

To Messrs. Neale Bros. (Nurseries), Ltd., Solihull, for an exhibit of Dahlias.

To Mr. Amos Perry, Enfield, for an exhibit of herbaceous plants.

To Messrs. M. Prichard & Sons, Christchurch, for an exhibit of herbaceous plants.

To Mr. A. C. Shipley, Bromley, for an exhibit of Chrysanthemums.

To Messrs. F. J. Spencer & Son, Hockley, for an exhibit of Dahlias.

To Mr. H. Woolman, Birmingham, for an exhibit of Chrysanthemums.

Banksian Medal.

To Messrs. Biddlecombe Bros., Bracknell, for an exhibit of Carnations.

To Messrs. B. R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses.

To Messrs. Carter Page & Co., London, for an exhibit of Dahlias.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

To Messrs. E. F. Fairbairn & Sons, Carlisle, for an exhibit of Dahlias.

To Home Meadows Nursery, Martlesham, for an exhibit of Aconitums and Dahlias.

To Messrs. J. Stredwick & Son, St. Leonards-on-Sea, for an exhibit of Dahlias.

Selected for trial at Wisley.

- | | | |
|---------------------------|------------------------------|--|
| <i>Scabiosa caucasica</i> | 'Rosa Mary Souter' | } from Mr. G. B. M. Souter,
Chichester. |
| " " | 'Souter's Charm' | |
| " " | 'Souter's Florist's Delight' | |
| " " | 'Souter's Free and Easy' | |
| " " | 'Souter's None Nicer' | |
| " " | 'Souter's Violet' | |
- Solidago 'Lemore,' from Messrs. Thomas Carlile, Ltd., Twyford.

Other Exhibits.

- Helianthus sport from 'Lodden Gold,' from C. B. Coleman, Esq., Cranbrook.
 Pelargoniums, from Mrs. D. R. Moore, Farnborough, Kent.
 Solidagos, from H. Walkden, Esq., Sale, Manchester.

and skilled commercial propagators arrange their programme so that cuttings of various plants which require approximately the same period to produce roots are inserted together, and the aim should be during the season for using the warm frame to obtain a quick succession of one crop after another.

The everyday care of cuttings inserted in warm frames calls for cleanliness in removing each day all leaves which have fallen; the lights covering the frames should be kept open for about one hour each morning, and the moisture wiped from the glass. The sand should be thoroughly saturated before closing the frames, and the temperature of the water being used should be that of the sand. It will generally be found, where the rooting medium consists of a mixture of sand and peat moss, that watering is not needed so frequently. The frames should be shaded during periods of bright sunlight, but over-shading should be avoided.

It is essential to pot up the cuttings struck in sand as soon as sufficient roots have developed, but those in the peat moss mixture do not require such urgent treatment. The potted cuttings must be returned to a close warm frame until they become established.

No harm is done by closely examining and moving those cuttings which take several weeks to produce roots, but in my experience it is not generally worth while keeping cuttings of deciduous plants in a warm frame after they have cast all their leaves. It will often occur that large callus growths will be developed on the base of cuttings which take a long time to root, and rooting may sometimes be hastened by removing part of the callus with a sharp knife.

Mention has been made of the insertion of cuttings in pots and plunging these in peat moss in a warm frame. This method is still largely used, and has much to recommend it. It is possible to make up appropriate rooting media for small quantities of cuttings, and to give these individual attention. The pots should be clean and well-drained, and the cuttings appear to root more successfully if they are dibbled in around the edge of the pot; in fact some propagators place a small pot inside a larger one so that the cuttings can be arranged around the rims of both.

Mr. COLLINGWOOD INGRAM has shown me a double pan which he uses for striking cuttings; the outer one is filled with water, which percolates through to the inner one, and this he fills with a mixture of finely chopped sphagnum moss and silver sand into which the cuttings are inserted. The pan is then plunged up to the level of the rim, and covered with a Bell Glass. This device appears to be particularly suitable for those who are unable to give regular daily attention to pots of cuttings.

I have seen cuttings of such plants as *Ceanothus* 'Gloire de Versailles,' which possess very brittle roots, inserted singly into small pots and then placed in a warm propagating frame, so that the check which would be sustained in transferring these from a sand bed to pots is eliminated.

There are certain plants which give poor results in a warm propagating frame, and also fail to respond satisfactorily in a cold frame or bell glass, and among these are such woolly-leaved subjects as *Buddleia Fallowiana*, and the gummy-leaved *Cistus*. These, however, can be very successfully raised if inserted in the late summer or autumn in a sand bed made up on an open staging in a warm greenhouse. Generally they remain in the sand throughout the winter months,

and are potted in the early spring, when new growth appears. The evergreen *Ceanothus*, such as *C. Veitchianus*, are particularly successful under these conditions, and also evergreen Azaleas, if inserted in a mixture of peat moss and sand in August.

The Sun Frame.—This is merely a frame without bottom heat, which is fully exposed to the hottest sun in July and August, into which cuttings of such plants as Double Gorse, *Genista hispanica*, and *Erinacea pungens* are inserted in silver sand, and thoroughly saturated on several occasions during the day. It is important to use warm water for this, but of course watering would not be necessary on dull days. This is a method not frequently seen, but I have used it with considerable success, and it gives quick results.

Internodal Cuttings.—For nearly all hard-wooded plants it is generally accepted that cuttings are made either at a joint, or node, or at the base of the current year's wood with a heel or small shaving of the previous year's wood, but Clematis cuttings are usually made by cutting through the stems about mid-way between two nodes, and these are called internodal cuttings. It is, however, wrong to assume that Clematis will only root from such cuttings.

Chemical Treatment and Plant Hormones.—No article on Vegetative Propagation nowadays would be complete without reference to the treatment of cuttings with growth-promoting substances. Immediately prior to the outbreak of war a great deal of information was issued from various Research Stations and other sources, and to provide what may be termed a clearing house for this a Plant Hormone Committee was formed under the aegis of the Royal Botanic Gardens, Kew. I served on this Committee as a practical propagator, and there is little doubt that if the work had been allowed to proceed without interruption considerably more useful information would by this time have been made available. Although it is admitted that much of the experimental work has been carried out by using plants which I consider can be easily rooted without chemical treatment, this has been done mainly perhaps for the purpose of finding out how these reacted to various chemicals used at different strengths. I would, however, like to see more work done on notoriously difficult plants. It is impossible within the scope of this article to give anything approaching a comprehensive account of the very valuable work which has been done, and for further information it is suggested that reference should be made among others to the works already published by the Boyce-Thompson Institute of America, *Plant Hormones and their Importance in Horticulture*, by Dr. H. L. PEARSE (*Technical Communication No. 12* of the Imperial Bureau of Horticulture and Plantation Crops, East Malling, Kent, Sept. 1939), *Experiments with Plant Growth Substances for the Rooting of Cuttings*, by Dr. C. R. METCALFE of Kew and Dr. W. G. TEMPLEMAN of Jealotts Hill Research Station, Bracknell, published in the *Bulletin of Miscellaneous Information* of the Royal Botanic Gardens, Kew, No. 8, 1939, and to Dr. TINKER's work at Wisley, published in the *R.H.S. Journal*.

Provided that due regard is strictly paid to the principles governing the successful propagation of trees and shrubs from cuttings, and that skilled practical propagators are consulted, it should prove of great benefit to continue the work, as most encouraging results have been obtained, but it is a mistake to consider that a magic potion has been found which will result in the successful raising of any plant from cuttings.

Leaf Bud Cuttings.—Certain shrubs, particularly *Camellia japonica* and its varieties, can be easily raised from cuttings made from a small portion of the stem, to which is attached a single leaf having a normal growth bud in the axil. The leaf bud cutting should not be confused with a leaf cutting, which has no such bud. This means of increasing Camellias is by no means a recent discovery, as reference was made to it in the *Gardeners' Chronicle* over one hundred years ago.

I have usually removed a shaving of the stem about $\frac{1}{2}$ inch long, with the leaf and bud, in October, and dibbled this into a mixture of peat moss and sand in the warm propagating frame. Roots have developed during the winter months, and in February the bud has commenced growth. I have then potted the cutting, and by the end of the first year a vigorous young plant has resulted. Mr. F. HANGER of Exbury informs me that he obtains very good results by inserting similar leaf bud cuttings in the early spring. I have not tried other trees and shrubs by this method, but it should prove interesting to carry out experiments.

Monocotyledonous Shrubs from Cuttings.—The propagation of the monocotyledonous shrub *Philæa buxifolia* provides an interesting example showing that the actual portion of the plant inserted as a cutting does not produce roots and become part of the new plant. Cuttings about 2 inches long are inserted in the warm bed of sand and peat moss, and towards the base of the buried portion of stem an adventitious bud is developed, and from this roots are produced. This rooted bud can eventually be severed from the original cutting and potted to form the new plant.

Root Cuttings.—The propagation of herbaceous plants such as *Anchusa* and *Verbascum* by cutting up their roots into small portions, which are termed root cuttings, is a well-known practice, but the raising of many trees and shrubs by similar means is apparently less known. The following among others can be increased from root cuttings: *Romneya*, *Rhus typhina*, *Rubus* spp., *Prinsepia*, *Spiræa arborea*, *Cydonia*, *Neillia*, *Rosa*, *Catalpa*, *Clerodendron*, *Ailanthus*, *Buddleia alternifolia*, and *Daphne Genkwa*. It is important to take roots from young plants, and care should be taken to ascertain that the roots used are not obtained from root stocks on which the particular trees or shrubs may be grafted.

The selected roots are cut into lengths of from 1 to 3 or 4 inches, according to their kinds; the top of the root cuttings, *i.e.*, the end nearest the base of the stem, is usually cut squarely across, and the other end cut with a sloping cut in order that the top may be readily identified and inserted uppermost. The root cuttings are then placed either in shallow drills out of doors in sandy soils, or better still placed upright in boxes or pots which are stood in cold frames. This work is usually carried out during the winter months, and in commercial practice suitable roots are selected when transplanting nursery stock. It has been found that *Prunus Avium* gives better results if the tops of the root cuttings protrude a little above the surface, and although the general custom has been to cover the roots of most of the plants mentioned, it may prove advantageous to try these in a similar manner.

Adventitious buds are produced from root cuttings which develop into new plants. Where trees are being raised, only one good stem should be allowed to grow.

It has been suggested that a much wider range of trees and shrubs

might be raised from root cuttings, and it will probably prove worth while experimenting to extend our knowledge of this branch of plant propagation.

BUDDING AND GRAFTING.

So much has been written on this subject that the layman often thinks the whole art of budding and grafting is steeped in mystery, and, therefore, beyond his powers. It must be confessed that some of the drawings found, particularly in old horticultural works, illustrating the various methods used give some basis for this view. Nowadays, however, professional propagators aim at simplicity, and generally consider that satisfactory results are best obtained where the cuts on the stocks and scions are reduced to a minimum.

The plant on which the variety to be increased is budded or grafted is called the stock, and the bud or portion of stem of the plant to be increased is the scion. Nurserymen talk of "working" the scion on to the stock, and the terms "bottom" or "top-worked" mean that bottom-worked plants are those where the scion is budded or grafted on to the stock at or about ground level, whereas top-worked plants are where the stem of the stock is allowed to grow up to the required height, and then grafted or budded on top of the stem. Wherever possible I prefer bottom-worked trees in order to avoid the unsightly swelling which may develop, where stock and scion are not compatible. Top-working is, however, necessary where it is not possible to develop a strong stem from ground level, and is particularly used for weeping trees, which in my opinion are too seldom seen with the height of stem required to show off their real beauty.

Budding varies from grafting in that only a single bud constitutes the scion, whereas a short length of stem with several buds is used for the grafting scion. Budding is normally carried out during June, July and August, on established stock plants out of doors. The stocks are usually about the thickness of a pencil, and the side branches are trimmed off to leave a clean stem on the portion just above the ground which will receive the bud. This section of the stem is sometimes referred to as the "neck." The bud is the normal growth bud found in the axil of the leaf on the current year's shoot, and this is severed from the stem with a keel-shaped piece of wood attached. The length of the section removed is about 1 inch, with the bud at about the half-way mark. The leaf is removed, leaving a portion of the leaf stalk, or petiole, attached to the bud. This proves most useful when handling the small bud. The wood is removed from the skin, leaving the heart of the bud plainly visible on the inside; this heart is often referred to by nursery propagators as the "germ," and if this is missing, leaving a hole at the back of the bud, it is discarded as useless.

A T-shaped cut is made on the stem of the stock, and the longitudinal cut kept open by inserting the end of the specially designed handle of the budding knife, so that it is easy to push the bud down inside the skin. The leaf stalk greatly assists in this part of the operation, and any surplus portion of the scion which protrudes above the cross piece of the T is cut off. The bud is then tied in with raffia, which must not be pulled too tightly or injury will be caused. This completes the operation, and only a few weeks need elapse to ascertain if it has been successful. If the bud has united or "taken" as it is called, it will be shown by the condition of the portion of leaf stalk which was left attached. If this drops off in a

natural way the bud usually grows, but if it withers and remains adhering to the bud this invariably fails. The raffia is cut away when no longer required.

The bud quickly develops during the following spring, and by the end of the year will, for such plants as the flowering Crabs, have grown into a stem of up to about 5 feet high. The stock plants are cut back to within about 6 to 9 inches of the ground during the January following the budding, and the young growth is eventually tied into this to prevent it being blown out by the wind. The portion of the stock thus left is called the "snag," and this is removed about a year from the date of budding, an operation referred to as "snagging." Considerable care is required in snagging to cut as closely as possible to the point of union of the stock and scion, in order to encourage the development of a straight stem for the new plant. One or two practical points concerning maintenance, which must be mentioned are those of excluding rabbits, which seriously damage young budded plants, and the need to be watchful for caterpillars, which appear to be especially fond of the growing points of the developing buds in the spring.

Among other plants increased by budding mention may be made of flowering Crabs, Cherries, Laburnum, coloured Hawthorns, Almonds, Sorbus, Lilacs, Roses and Cotoneasters, and examples of suitable stocks *Laburnum vulgare* for *Laburnum Vossii* and *L. Adami*, *Syringa vulgaris* for Lilacs, Seedling Crab for *Pyrus purpurea*, Quickthorn for coloured Hawthorns, Common Horse Chestnut for *Aesculus carnea* var. *Briotii*, *Prunus Avium* for flowering Cherries, *Cotoneaster frigida* for *Cotoneaster Watereri*.

Grafting.—Grafting in its various forms is carried out over a longer period of the year than that for budding. Outdoor grafting on to established stocks is done in March and April just as the sap is rising. In certain cases the wood from which the scions are made is removed in the winter months, and laid in under a northern exposure to ensure that the growth of the stock is in advance of the scion. The stocks are beheaded a few inches above the ground, and the method of grafting generally employed is that called "whip and tongue." This is done by cutting the stocks and scions so that long clean sloping cuts are obtained, and in order to assist these to become securely united corresponding cuts are made which fit into each other, care being taken to join the cambium layers which are just underneath the bark. The stock and scion are then bound together with raffia, and the union carefully covered with grafting wax to exclude water and air. The cut surfaces soon unite, and as growth develops the raffia will be broken and is usually removed. Unlike budding, where normally a single stem is developed, more than one bud on the grafting scion may grow, and where trees are being raised it is necessary to restrict the new growth to one good stem. The first year's growth from graft or bud is referred to as "maiden growth."

Indoor grafting is widely practised, and in certain cases this is done by working the scions on to stocks already established in pots, while in others the stocks are potted after grafting. The stocks may consist of the stems of plants, but in such cases as Clematis, Wistarias, and Lilacs the scions are grafted on to roots. During late years Rhododendrons also have been very successfully grafted on to the roots, and this procedure has eliminated the growth of suckers.

The usual procedure when using established stocks for such plants

as *Viburnum Carlesii* is to graft in July and August by beheading the stocks, and making a simple upward sloping cut on the side of the short portion of stem which remains, and a corresponding cut on the scion, which consists of a half-ripened shoot of the current year's growth with two pairs of leaves. The scion is then fitted to the stock, so that the cambium layers unite, and bound with raffia. Grafting wax is not used, as the newly grafted plants are placed in a warm propagating frame. It is most important to prevent the potted stocks from becoming dry at the roots. Hamamelis are grafted at the same time, but the stocks are not beheaded, the scion being fitted on to the side of the growing stem—this method is termed "side grafting." Rhododendrons are usually "saddle grafted" on to established stocks in January and February; the stock is beheaded, leaving a sharp wedge-shaped cut, and the scion is cut so that a wedge-shaped portion of the base of the stem is cleanly removed; this is then fitted down saddle-like on to the wedge-shaped stock.

In February and March grafting of scions on to pieces of roots is largely practised for increasing Clematis and Wistarias. Young roots of a suitable thickness are obtained, and scions of a corresponding size are selected. Simple sloping cuts are made on both stock and scion, and the two fitted together, and after binding with raffia they are potted and placed in a propagating frame. Clematis grafting calls for considerable skill on account of the minute size of the scion, which is obtained by forcing on the growth of the parent plant to produce young shoots, and then with a very sharp knife cutting through the stem at a joint or node, so that the two opposite buds are separated. The small thin section consisting of one bud is then shortened to less than an inch in length, and neatly joined on to a small portion of the root of *Clematis Vitalba*. This is then potted into a small pot so that the grafting union is just above soil level. As the young plant develops it is potted on, and in many cases on being planted out roots will be produced from the scion above the union.

Some nurserymen lift stocks of Cherries and Crabs in very early spring, and bring these indoors on to a potting bench, and, after grafting and carefully waxing, plant them out in nursery beds; this method is referred to as "bench grafting."

It is a normal procedure in the early spring to examine the lines of budded plants in the nursery, and where any have failed, to make good the losses by grafting the stocks with scions of the appropriate varieties, so that no gaps occur; this is referred to as "gapping" or "mending."

Much more could be written on Vegetative Propagation, and I am fully conscious of the limitations of the foregoing account. It will, I hope, be readily appreciated that only a few plants could be mentioned, and the inclusion of a comprehensive list of flowering trees and shrubs, describing the method by which each is increased, would require more space than can reasonably be placed at my disposal. It can very truly be said that a propagator has never finished learning, and in that concluding remark lies the great fascination which Plant Propagation has for me.

(The processes described are illustrated in Figs. 97-105.)

SOME ROSE HYBRIDS.

By A. T. JOHNSON.

ONE of the most interesting and garden worthy of our Rose hybrids is *R. 'Nevada.'* Purporting to have been raised by PEDRO DOT as a cross between *R. 'La Giralda'* and *Rosa Moyesii*, this has made a shapely bush of about four feet, but will grow taller. The wood is mahogany-red, only moderately prickly, and the broad-leaved foliage a fresh apple-green, the leaves being thin and flaccid. The elegant branches, which arch over to the ground, bear on short laterals semi-double, milk-white, saucer-shaped blossoms up to five inches across with a basal glow of yellow, every branch, from base to tip, being wreathed with these magnificent and fragrant blooms. Add to this the apricot and crimson of the opening buds and the flakes of crimson often appearing on the broad richly textured petals and you have a Rose of striking distinction and full of quality. Moreover, beginning to flower in May, it will be more or less "in production" until the end of summer.

Rose 'Le Rêve,' an H.T. ('Mme. Eugène Verdier' × 'Persian Yellow'), seems often to be regarded as an old hybrid which has had its day. But it is not so old, with only twenty years to its credit, and I am convinced that it deserves something more than the scant recognition it now enjoys. It is a climber, but we grow it as a tall bush, with light shade, and always admire the bright green of its glossy foliage set with large vivid citron-yellow, very fragrant semi-double blossoms which, if a trifle *négligé* in form, are none the worse for that in our informal borders. 'Le Rêve' flowers in late May and June, and though I have heard it accused on the score of black spot it has never given us any trouble in that respect or any other. Sometimes called the 'Yellow Mermaid,' it is not so fiercely armed as that famous beauty and its branches, being comparatively flexible, are more trainable. In spite of its origin, it is so hardy it has withstood frost which killed outright some of our China Roses growing close by.

Another hybrid which owes something to 'Persian Yellow' is *R. rugosa* 'Agnes,' and among the many fine shrubs of its class it is one we value highly. Of Canadian origin, 'Agnes' presents an erect but graceful bush of five or six feet. The broad, wrinkled, glossy foliage is nearly typical *rugosa* and the flowers it bears so profusely from mid-spring for some six weeks are three inches across, fully double and open flat. In colour they are a soft ivory-chrome with some amber in the depths and in fragrance this Rose can rival anything the season yields. *R. 'Agnes'* is a thoroughly good doer, like most *rugosas* putting-up with a meagre soil, and the foliage is remarkably disease-free. Yet another *rugosa* hybrid must be included here—though the claimants for notice are many—and that is 'Sarah van Fleet.' Also American, this is reputed to be a cross between *R. rugosa* and the H.T. 'My Maryland.' In the broad foliage, bold and glossy, it rather "favours" the species, but the flowers are its own and so distinct are they and so attractive that once seen they are not likely to be mistaken for any other. Produced with that measured luxuriance which is often more telling than profusion, the blooms of 'Sarah van Fleet,' four inches across, are semi-double, widely bowl-shaped and an exquisite wild rose pink warmed by the slightest hint of flesh—

something of the delightful hue of *R. alba* 'Celestial' at its best. These firm well-built blossoms are intensely fragrant. They are produced from late May to autumn, standing up well to both sun and weather, and the shrub (about six feet) is admirably balanced and immune to disease and pests.

R. villosa 'Wolley Dod' (not to be confused with "Wolley Dod's Rose," 'Janet's Pride,' a *R. rubiginosa* hybrid found in a hedgerow by the old Cheshire parson) may not be a hybrid, but it is difficult to believe it to be anything else. I know nothing of its origin, but in habit and other characters it suggests a *R. alba* influence along with that of the capricious *villosa*. But this matters little in the garden and we have in this Rose a symmetrical, almost thornless, shrub of five or six feet with downy sage-green leaves which happen to be so attractive a setting for the blossoms, these being almost the same lovely pink as those of 'Sarah van Fleet.' Up to three inches across, these flowers, semi-double and delicately scented, are freely yielded in the later spring and followed by orange-red fruits, large but not so large as those of the typical "Apple Rose." Also very desirable among pinks is that Rose which, having had a run as *R. Wilsonii*, is now called *R. microgosa*, it being a *R. microphylla* \times *R. rugosa* hybrid. A compact medium-sized shrub with handsome foliage clearly denoting *rugosa* blood and strikingly immune to disease, this worthy plant produces in May, with intermittent later flowers, single blooms of remarkable quality. Four inches across at least, these are fragrant and a lovely clear silver-pink, much the colour of the Damask hybrid 'Lady Curzon,' their only fault, if it be a fault, being that thinness of texture characteristic of the latter.

A Rose we grow labelled *gallica complicata* stands out pre-eminently among singles. Its origin is unknown to me but it is manifestly a hybrid and has little about it to suggest a *gallica* influence. A lusty shrub of some five feet with double the spread, owing to the outward lean of the branches, the foliage of this remarkable Rose is broad, smooth and a full-toned green. It flowers but once, usually from mid-June onwards, but since the blooms of its copious clusters open in succession its season is a long one. Often five inches across, the broad-petalled blossoms are rose-pink, rich in tone and intensely vivid, and the shrub has always been singularly healthy and full of vigour. Flowering at the same time and here reaching about eight feet is that fine old veteran, *R. Dupontii*. Reputed to be a *R. moschata* \times *gallica* hybrid, there is distinction as well as quality here. The more or less erect branches are practically thornless, the ample foliage a pale yellowy green and the single, widely bowl-shaped blossoms of three or four inches are a lovely blush-tinted white and fragrant. This again is among the pest-frees and it flourishes under the meagre conditions which all mentioned here endure so cheerfully and that with the barest minimum of cultural care.

PROPAGATION, DEGENERATION AND VIGOUR OF GROWTH.

By M. A. H. TINCKER, M.A., D.Sc.

IN the near future there will be an increased demand not only for fruit trees and bushes but also for many decorative plants to restock gardens after the war years. Nurserymen are now turning their attention and the labour available to the raising of such plants. The interest of Fellows, and others, has been reawakened by the recent lectures, discussions, and reports in this and other Journals. Many questions relating to the propagation of flowering shrubs and trees have been recently asked; one repeatedly put is whether, or not, continued vegetative propagation results in the degeneration of the plants so produced. A complete answer cannot readily be given for all plants within the limits of a short article, but it is the present intention to set out well-established facts which it is hoped may serve as a general introduction to such considerations.

By degeneration is, presumably, meant the loss of the good points and qualities associated with, and proper to, the kind of plant indicated; such points would include the yield of crops. Degeneration stands in sharp contrast with continued vigour and robust, healthy growth. The question implies in the term "continued" vegetative propagation, repeated multiplication, perhaps for many years, resulting in a great number of plants, all closely alike in appearance, structure, and in internal composition; such a plant population, termed a clone, may be regarded as truly homogeneous. Further, the plant population of a variety, such as a Potato variety, so produced by tubers, may be considered as one plant separated in space and time into many replicated units. It differs widely from a population raised by seed, where the plants may vary, at least in minor visible points, and probably in points not so easily recognized, such as disease resistance.

Normally seeds result from either cross- or self-fertilization of the parental plant, but in some plants, such as varieties of Citrus and in certain Composites, true fertilization may not take place and the maternal tissues around the egg-cell may give rise to a seed by a process that might be termed 'internal budding.'

When cross-fertilization takes place there is a reasonable chance that the two parents were not precisely similar; when they differ, even slightly, the hereditary units, or genes, passed from the parents by the sexual cells to the new plant, to be formed after fertilization, may also differ. The seedling that ensues is of a hybrid nature in regard to certain characteristics.

If plants that are normally cross-fertilized in the garden be deliberately self-fertilized the plant breeder has learnt to expect to obtain a few dwarf or freak plants which grow very slowly; this slow development is often associated with lack of green pigment in part of the plant and is also accompanied by other structural defects in the flowers and elsewhere. Such plants, of more interest than horticultural value, might be termed genetically degenerate. In addition to this occurrence, self-fertilization of normally cross-fertilized plants has been reported to result in appreciable loss of vigour and of quality (see LAWRENCE).

In other plants, self-fertilization takes place normally ; and here it may be remarked that this process occurs in some plants possessing quite elaborate flowers which to all appearances are well designed and suited for cross-pollination by insects. In such "selfed" plants it is probable that for many generations the true-breeding weaklings, having inherited the tendency from both sexual cells, have been eliminated by natural competition. When two true-breeding plants, normally self-fertilized and of different genetical constitution, are deliberately crossed, the union of the sexual cells carrying genes widely differing, results in a hybrid plant of vigorous growth. The term "hybrid vigour" is particularly applicable to such plants, and indicates more rapid growth, more luxuriant foliage and vegetative development observed in comparison with that of the parents. This vigorous development *may*, but not of necessity, be followed by early flowering or fruiting on an increased scale.

Hybrid vigour has perhaps not been duly appreciated by all horticulturists. It is most noticeable in the first generation, and the magnitude of the effect decreases in subsequent generations ; the greatest stimulus follows immediately upon the introduction of the different genes into one individual. But once obtained by such a cross the vigour of the hybrid may be maintained if the plant can be multiplied by vegetative propagation (and provided that no infection by virus disease takes place). To maintain the vigour, if propagation by seeds is obligatory, it is necessary to repeat each year the original cross, such is the well-known process with Maize, where it is usual to remove at an early stage the male flowers from the plants intended as seed parents. By planting in adjacent rows any other variety, hybrid seeds are obtained.

But hybrid vigour is no newly recognized phenomenon, for before MENDEL'S work led to the extension of the science of genetics horticulturists such as ANDREW KNIGHT vaguely recognized the facts, and later DARWIN brought forward much weighty evidence to show that vigorous growth frequently follows cross-fertilization in Maize, *Eschscholzia*, *Petunia*, and other garden plants.

Thus stimulation to vigorous growth may well result from cross-fertilization. By vegetative propagation this stimulation is precluded ; but it does not therefore follow that degeneration takes place. The vigour of growth, however, can be controlled in clones. It is now well known that where grafting or budding is employed, the interplay between stock and scion regulates the vigour of development of the resultant tree. It is no part of this article to consider these most interesting phenomena so thoroughly investigated and reported upon by the East Malling and Long Ashton Research Stations, to whose reports the interested reader will have already turned. Although the Apple stocks show such a wide range of response in vigour—from the most vigorous through semi-dwarfing to dwarfing—there is no suggestion of "degeneration," as defined, in such phenomena and the term is inapplicable ; as it is also to the control of the development of the root system of seedlings by the scions inserted into them. In Plums, where perhaps the range of response is generally somewhat narrower, there occur cases of incompatibility between stock and scion, as 'Czar' on Common Plum, but these are considered rather as cases of failure to unite, and as such are outside the definition of "degeneration" ; in cases where union occurs and some development takes place followed by decline the plant is short lived. There is perhaps a stronger case to be made out

for the inclusion of evidence that stocks may predispose the scions to infection by pathogens causing gradual decline.

After mention of these omissions, one may turn to consider a few examples of rapid degeneration the nature of which has been elucidated in the last twenty years or so.

For the tubers of promising varieties of Potato some forty or fifty years ago large sums of money changed hands. Many of these varieties are but curiosities to-day. It is also universally recognized now that to obtain satisfactory tubers that will give good yields it is necessary to produce them in northern latitudes or in areas where they were grown at high altitudes. The researches of the plant pathologists and entomologists, such as those carried out by SMITH and others at the Potato Virus Research Station, and elsewhere, show most clearly that virus diseases, transmitted by aphides, are primarily responsible for the observed degeneration. The complexity of the relationship between host plant, insect vector, and virus has been at least partially unravelled, and the reader is referred to the standard works of SMITH and BAWDEN for detailed interesting accounts of this work. Agronomically, there can be no doubt that where the climatic and other conditions of the environment prevent the spread and limit the increase of the aphides responsible for virus transmission, there "clean" tubers can be produced, as DAVIES' and WHITEHEAD's work showed in North Wales. The older idea that degeneration might be ascribed to physiological causes or cultural conditions was clearly disproved by a series of experiments designed to test these points and carried out by BROWN and BLACKMAN (1930) at several centres with three varieties; briefly, these investigators reported that where there was no virus disease there was no decreased yield, and seed tubers grown for one or two years without infection gave yields similar to those from Scotch tubers, and that "a general correlation was observable between the amount of virus present and the falling off in cropping vigour."

In regard to such degeneration, which may take place quite quickly, it is almost unnecessary to remind readers of the ability of the aphides to multiply rapidly, by sexual and asexual reproduction, and of the opportunity presented to the pest by a field of plants of uniform constitution growing together.

Discussing the "Mosaic" disease of the Raspberry 'Lloyd George,' HARRIS (1935) stated that the Mosaic disease is infectious and spreads under natural plantation conditions and that the vigour of infected stools and their progeny "surely if slowly decreases from the time of infection." "The inference from this is, that unchecked the disease must inevitably infect the whole available 'Lloyd George' canes in cultivation, and when this occurs it can only be a matter of time before the variety ultimately becomes commercially non-productive and useless." "This has already occurred in other sometime popular and widely planted varieties such as 'Mitchell's Seedling' and 'Superlative.' . . ." "Thus it is evident that failure to control this spread of Mosaic in susceptible varieties must inevitably lead to their extinction."

Here then are classic examples of degeneration leading to extinction. Such observations have led to the expressed view that vegetative propagation causes degeneration; but more accurately it should be stated that the virus is the responsible cause and vegetative propagation facilitates its spread.

Where the insect vector is not recognized, control is rendered more

difficult. Further difficulties and complications arise when varieties act as "carriers" of the virus, capable of acting as sources of infection though the plants themselves do not show obvious signs of being diseased.

With Lilies, imported bulbs of *L. auratum* often rapidly "degenerate" and die out; other Lilies such as *L. speciosum* suffer severely from the virus infection, yet others such as *L. tigrinum* may be infected and yet persist and grow fairly well for many years, but their bulbils carry the infection. There are also other plants that may be infected with this virus. In these cases it is most desirable to select virus-free plants for propagation by scales or other vegetative means. The advantage of using seeds is mentioned later.

In regard to the propagation of Raspberries and Strawberries careful inspection and certification has undoubtedly brought about much improvement, but it is now suggested that propagation might with advantage be centred in northern districts of Scotland free from aphids. Perhaps under natural conditions the spread of some plants highly susceptible to virus diseases has been limited by such a mechanism to northern latitudes; the difficulties of cultivation are soon met in southern latitudes.

In general it may be stated that, allowing for certain exceptional evidence, virus diseases are not carried by seed, so that in early life seedlings are free from infection. Virus-free seedlings can also be obtained from the seeds produced without true fertilization by budding of the maternal tissue, and this occurs in the case of certain Citrus varieties.

In a batch of seedlings of varying constitution it is likely that some of them might prove capable of resisting the virus in some degree. So that in such a population some would tend to persist and might form a natural barrier to the very rapid spread of the disease. At the John Innes Horticultural Institute and elsewhere Raspberries are being raised from seed with this end in view. It is necessary for the seedlings to produce uniform fruits, but they may with advantage differ vegetatively if that diversity includes resistance to the virus disease. Such a population would at least be more permanent than a clone of highly susceptible plants.

It may be mentioned that certain other (fungal) diseases are readily spread by vegetative propagation, as is the Wilt disease of Carnations. Rapid decline and death may follow, but to these the term "degeneration" has not been generally applied.

There is other evidence to support the view that vegetative propagation does not necessarily imply degeneration. There can be no doubt about the antiquity and persistence of some cultivated plants usually propagated vegetatively. There are Apples described by BUNYARD, such as 'Api,' possibly dating from Roman days, as 'Norman's Pippin,' considered to be of monastic importation, as 'Devonshire Quarrenden,' mentioned by WORLIDGE in *Vinetum Britannicum*, 1678, which are known to modern pomologists. There is, however, no reliable evidence concerning any possible decline in flavour, as comparison with that enjoyed by patrician, plebeian, or monastic palate of ancient days is not possible. It would seem a more reasonable supposition that these varieties have not succumbed to virus disease during these long periods rather than to make the twofold supposition that they are true breeding and have from time to time been "regenerated" by seed production. Evidence upon these

matters may still be obtainable. Then there are seedless varieties of fruits, such as of the sour Orange—var. 'Goleta'; and varieties of the Navel Orange which rarely produce seed; and of the Lemon such as 'Eureka' that requires cross pollination for seed production. Here there is evidence of lost vigour, and signs of degeneration are accompanied by virus infection. Similarly with Bananas, which are also seedless, a stunting of the plant occurs when certain virus diseases are present. So that these cases do not give clear evidence of disease-free persistence and continued vigour, accompanying obligatory vegetative propagation.

Mention may also be made of the old Roses which have persisted for a great many years in cultivation. The evidence of loss of vigour is at least very scanty, as it is in the flowering Cherries and such common herbaceous plants as *Achillea ptarmica* fl. pl., which rarely produce seed. This evidence indicates survival of plants that either resist or tolerate virus infection well.

This article may be summarized by stating that the reported degeneration associated with continued vegetative reproduction is very largely, if not entirely, caused by virus infection. Seedlings, some of which may be particularly vigorous, usually commence their life free from virus infection, and in a population of mixed characteristics no doubt a few will offer resistance to the virus disease and may survive. There is always a danger of infection. By vegetative propagation infected material spreads the virus disease into new areas; and plant tissue once infected does not become virus free unless seeds are formed.

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THE CULTIVATION OF MELONS.

By I. W. READ.

MELON culture extends far back into the past ; little, if any, advance seems to have been made in the general treatment to which these plants are subjected.

Text books quote methods used by our great-grandfathers, and private gardens, with little variation, seem to follow these ancient practices. This is strange, seeing that Melons are capable of thriving under a wide range of conditions. In relation to soils, atmospheric conditions, and temperatures, provided these are consistent, the range is wide, minimum temperatures being the most important item. This should not be allowed to fall below 60° F. at night in winter, but in early summer 65° F. is preferable. Maximum temperatures may go up to almost anything, so long as the fruit is protected ; I have seen these almost, if not completely, cooked where the sun caught them in really hot weather. Shade can be given to safeguard them from this extreme.

Soil can be of any garden variety ; it should be well matured and rich for early and late plantings. The beds may be rammed solid, or kept loose. If Melon plants produce misshapen or crippled fruit, then rammed beds should be resorted to, but very few varieties, I believe, require this. 'Sutton's Eureka' is the only kind that I have grown which proved an absolute failure in loose soil. Some Cantaloups have a tendency that way, especially if fruits are taken on young plants. Apart from farm yard manure, the only artificials used are bone meal and potassium sulphate. The Melon is very partial to potash, but the amount needed varies greatly according to the soil. Nitrate of potash in solution is used during the growing season : lime is incorporated in the compost as required.

Seeds should be sown on loose soil, flattened gently, then well watered and covered. My practice has always been to water with a weak solution of sulphate of copper, such as Cheshunt Compound. The seedlings ought to be ready for potting by the fourth day, 2½-inch pots being used ; the pots are grasped by the thumb and second finger, the first finger being held in the pot ; soil is poured in by the right hand while the pot is tilted to one side. The first finger is pressed on the soil making it firm enough to keep its position. The seedling is then placed so that when the pot is filled the young plant is just able to stand upright, but only just. This is an extremely important point, as it is at this point that Canker is induced. When planting out, the ball of soil should be kept as high as possible. The plants may be watered in to settle the soil at the base of the ball ; after this give just sufficient moisture to keep the plants growing ; let them look rather unhappy, but do not actually stunt them. When the plants have made about six leaves or so, cut away two or three which may shade the stem at point of contact with the soil. This is also a most important practice for, provided this part of the plant is fully exposed to strong light or sun for a few days, there is no fear of Canker appearing during the life of the plant. Continue to water rather sparingly until the fruits are the size of a swan's egg, after which it may be given without stint.

Very early in the year no ventilation need be given, but in the summer months ventilation is necessary, combined with a drier atmosphere. Late Melons should be plentifully ventilated and grown slowly. Early Melons, from seed sowing to ripening, may be given 14 weeks; summer crops need 10 weeks, and winter Melons should be allowed 16 weeks. These last store up vitality during the long season of growth and pass it into the fruits later. Our earliest seeds were sown January 11; batches were sown weekly until September 14, which was the last, and the crop from this sowing was timed to be ripe for the Christmas market. All crops were grown to dates and cutting varied according to the times of the year; thousands were marketed daily.

Growers are always told to fertilize the whole crop at the same time. In pre-war days we set each batch so as to clear the set in eight days. Since quantities are regulated and only a few thousand are allowed to be grown, the setting takes place over months. I have grown a plant sixty feet in length which produced fruit throughout its entire length. Melons are long lived for annuals and within this limit their life is governed by space to extend in. We never net the fruits and they hang until ready for market, fully coloured. This feature can, I believe, be bred into all varieties of Melons, with the possible exception of some Cantaloups.

Should Melons be required during January or even February, seed need not be sown later than early September; it is preferable to set the crop later on older plants. The only month during which Melons have not been cut here is the month of March. To supply this period would need seeds sown in December. I have never been interested in March production, nor in January or February, as it is not a profitable proposition. All varieties of Melons do not lend themselves equally to December cropping, but 'Sutton's Superlative' may be tried with confidence.

Melons can be grown successfully in any kind of glass structure; we are now growing them in houses 6 feet high at the eaves, 150 feet long by 28 feet wide. They are trained up fillis in exactly the same way as are Tomatoes, and crops are continually being set on the same plants over very long periods. When the plants reach the limit in height they are trained downwards and fruits still set, or shoots generally break near the ground; if they do, these can be trained upwards and cropped. After cutting off the few leaves mentioned earlier never use a knife on Melon plants, and do not remove unnecessary growths—prevent them. Melons are the easiest possible crop to grow when understood.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Carnation 'Constance Pullen.' A.M. July 26, 1945, as an exhibition variety. A border variety with good stiff stems and perfect shaped flowers, 3 inches diameter, centre rather loose, pure glistening white, of good substance; calyx strong. Shown by A. G. Pullen, Esq., Findings, Wormley, Surrey. See p. liii.

Cattleya × 'Stalln' var. 'Victory.' A.M. July 24, 1945. The spike bore two large and well-formed flowers of purplish-rose colour, the labellum crimson-purple, except for the throat area which is

golden amber colour. The result of crossing *C. 'Angus'* with *C. 'Gloriette.'* Exhibited by Messrs. Sanders, St. Albans. See p. liii.

Chrysanthemum 'August Red.' A.M. August 28, 1945, as an early flowering variety, suitable for exhibition. Flower stems 20 inches long, with medium sized foliage. Flowers double, 4½ inches diameter, crimson-bronze, centre florets old gold, reverse old gold. Raised and shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. liv.

Chrysanthemum 'Egerton.' A.M. August 14, 1945, as an early flowering variety, suitable for exhibition. Flower stems stiff, 18 inches long; flowers double, 5 inches diameter, rosy salmon-bronze with golden-amber reverse to the petals. Sport from 'Sweetheart.' Shown by Mr. George Lamb, Egerton Nursery, Hextable, Swanley, Kent. See p. liv.

Chrysanthemum 'Fair Maid.' A.M. August 28, 1945, as an early flowering variety, for exhibition. Flower stems 18 inches long, with large dark green foliage. Flowers 6 inches diameter, double, very pale mauve-pink. Raised and shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. liv.

Chrysanthemum 'Red Sweetheart.' A.M. August 28, 1945, as an early flowering variety for exhibition. Flower stems 19 inches long, with medium-sized foliage. Flowers 4 inches diameter, double, a reddish-bronze sport from 'Sweetheart.' Shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. liv.

Hesperoyucca Whipplei. A.M. July 24, 1945. This uncommon species came to British gardens from California, and first flowered in this country about seventy years ago. It is practically acaulescent, forming a dense rosette of narrow, glaucous leaves up to 2 feet long, the older ones recurved. In flower it is extremely handsome, for the erect stem, rising 10 feet above the foliage, bears on its upper two-thirds over a hundred slightly pendent flowering branches, each carrying between ten and twenty fragrant flowers. The individual flower is 3 inches across, and is composed of six lanceolate, spreading, ivory-white perianth-segments, six fleshy, white stamens and a short, erect ovary with short style and capitate, papillose stigma. Exhibited by Lord Aberconway, Bodnant, N. Wales. See p. liii.

Malus 'Simcoe.' A.M. July 24, 1945. This very attractive Crab received the A.M. on April 30, 1940, as a flowering tree. It is now recommended for the beauty of its fruits, which are nearly an inch across, somewhat flattened at each end, of a rich crimson colour, ripening in advance of most of the ornamental Crabs. Exhibited by Iris Lady Lawrence, Springwood, Godalming. See p. liii.

Styrax japonicus var. *Fargesii.* A.M. May 29, 1945. *Styrax japonicus* is a small, graceful tree with slender, spreading or somewhat drooping branches. The oval, pointed leaves vary from 1 inch to about 3 inches in length. The pure white, saucer-shaped, pendulous flowers, which are borne in great profusion, have five ovate, pointed petals. A most beautiful and satisfactory plant for a sheltered, slightly shaded spot in a light soil containing some peat or leaf-mould. The variety differs from the typical form in having larger leaves and flowers with purplish-brown pedicel and calyx, and is at least a week earlier. Exhibited by Capt. Collingwood Ingram, Benenden, Kent. See p. xliii.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXX



Part 12

December 1945

THE SECRETARY'S PAGE.

Subscriptions.—Fellows and Associates are asked to remember that their subscriptions to the Society fall due on January 1. It is particularly requested that any changes in personal or bankers' addresses should be sent in as soon as possible, so that there may be no delay in receiving either tickets or JOURNALS. It often happens that changes of addresses are sent late in the month and it is not then possible to alter the wrappers of the JOURNAL for a punctual delivery for the month.

Programme for 1945.—The Annual Meeting to receive the year's report and accounts will be held on Tuesday, February 19, 1946, at 3 P.M., on the Society's premises; there will also be a Show.

The following Calendar of Meetings and Shows has been arranged :—

February 19, 20.	July 16, 17.
March 12, 13.	„ 30, 31.
„ 26, 27.	August 13, 14.
April 16, 17.	September 10, 11.
„ 30 and May 1.	„ 24, 25.
May 14, 15.	October 8, 9.
„ 28, 29, 30.	„ 22, 23.
June 18, 19.	November 5, 6.
July 2, 3.	December 3, 4.

The following competitions will be held :—

March 26, 27	. . . Daffodil Competition.
April 16, 17	. . . Daffodil Show and Sewell Medal Competition for Alpines.
„ 30 and May 1	. . . Rhododendron Competition.
May 14, 15.	. . . Flowering Tree and Shrub Competition and Sewell Medal Competition for Alpines.
June 18, 19	. . . Flowering Tree and Shrub Competition.

July 2, 3 . . .	Lily Competition and Soft Fruit Competition.
„ 16, 17 . . .	Clay Cup Competition for Scented Roses,
„ 30, 31. . .	Fruit and Vegetable Competitions and Hardy Flower Competition.
August 13, 14 . .	Foremarke Cup Competition for Gladioli.
September 10, 11 .	Cactus and Succulent Competition and Flower Arrangement Competition for Amateurs.
October 8, 9 . . .	Fruit and Vegetable Show and Flower Arrangement Competition for Professionals.
„ 22, 23 . . .	Orchid Challenge Cup Competition and Tree and Shrub Competition.

Any changes in this programme will be announced in the monthly JOURNAL on this page.

Demonstrations at Wisley.—The following demonstrations will be held at Wisley during 1946 :—

Vegetable Garden.

March 6, 7 . . .	Outdoor Seed Bed and Seed Sowing .	2-4 P.M.
May 1, 2 . . .	Control of Vegetable Pests and Diseases	2-4 P.M.
May 15, 16 . . .	Thinning, Transplanting and Successional Cropping	2-4 P.M.
September 18, 19 .	Harvesting and Storing	2-4 P.M.
October 9, 10 . .	Digging, Trenching, Manuring and Composting	2-4 P.M.

Fruit Garden.

March 27, 28 . . .	Spring Spraying of Fruit Trees	2-4 P.M.
July 10, 11 . . .	Summer Pruning of Fruit Trees	2-4 P.M.
November 6, 7 . .	Planting of Fruit Trees and Roses	2-4 P.M.
December 4, 5 . .	Pruning of Fruit Trees	11 A.M.—1 P.M.

Flower Garden.

March 13, 14 . . .	Rose Pruning and Pruning of Shrubs	2-4 P.M.
March 20, 21 . . .	Seed Sowing and Vegetative Propagation of Alpines	2-4 P.M.
June 5, 6	Summer Pruning of Shrubs	2-4 P.M.
August 7, 8 . . .	Vegetative Propagation of Shrubs and Herbaceous Plants	2-4 P.M.

In case of bad weather, a talk with lantern slides will be substituted. Fellows and their friends are asked to notify the Director, R.H.S. Gardens, Wisley, nr. Ripley, Surrey, of their intention to attend.

The Society's Examinations.—Candidates who wish to enter for the Society's examinations in horticulture in 1946 are reminded that the closing dates for entry forms are as follows :—

General (Senior and Junior).—Monday, January 7, 1946.

Teachers' (Preliminary and Advanced).—Friday, December 14, 1946.

N.D.H. (Preliminary and Final).—Friday, February 1, 1946.

Lectures.—A programme of lectures is being arranged, and their subjects and dates will be given monthly in the JOURNAL. The first lecture will take place on March 12, at 3 P.M., in the Lecture Room of

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EDITOR :
VERA HIGGINS, M.A., F.L.S.

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1945

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CONTENTS OF VOL. LXX.

	PAGE
THE SECRETARY'S PAGE ...	1, 37, 57, 93, 121, 153, 185, 217, 251, 277, 309, 341
WISLEY GARDENS.....	3, 38, 58, 94, 122, 154, 186, 220, 252, 279, 311, 343
GARDEN WORK.....	5, 39, 60, 96, 124, 156, 188, 222, 254, 281, 313, 345
SIZE OF EXHIBITION VEGETABLES	7
AWARDS TO PLANTS IN 1944-45 ...	9, 53, 151, 183, 214, 245, 275, 305, 339, 366
NOTES ON JAPANESE CHERRIES, PART III. By C. Ingram	10
WHO WAS JOHN HOLLYBUSH ? By the Bishop of Truro	19
PLANTS FOR THE WINTER GARDEN. By F. Hanger. <i>Illustrated</i>	21
A SUSPECTED VIRUS DISEASE OF SHALLOTS AND ONIONS. By D. E. Green. <i>Illustrated</i>	24
BUSH AND SOFT FRUITS FOR THE PRIVATE GARDEN. By T. E. Tomalin ...	29
TRIALS AT WISLEY :	
EARLY FLOWERING CHRYSANTHEMUMS	32
DAHLIAS	34
NARCISSI	89
BORDER CARNATIONS	119
BOOK NOTES	36, 56, 120, 152, 308, 368
FLORISTS' FLOWERS—DELPHINIUMS. By H. S. Hotblack. <i>Illustrated</i> ...	42
ORCHIDS IN EQUATORIAL BRAZIL. By C. S. Garnett. <i>Illustrated</i>	48
ARCTOSTAPHYLOS MANZANITA. By A. T. Johnson	52
SWEET OR SUGAR CORN. By W. F. Giles	54
THE MAKING OF LANARTH. By the Bishop of Truro. <i>Illustrated</i> ...	63, 104, 132
WHO WAS WHO ? By A. Simmonds. <i>Illustrated</i>	73
LILIUM CATHAYANUM. By H. F. Comber. <i>Illustrated</i>	78
THE DUKE'S TEA TREE. By E. Cahen	79
DWARF AND BUSH TOMATOES. By F. C. Brown. <i>Illustrated</i>	81
THE CARROT FLY AND ITS CONTROL IN GARDENS. By C. Fox Wilson. <i>Illustrated</i>	84
THE ORIGIN OF APPLE 'BRAMLEY'S SEEDLING.' By A. Simmonds. <i>Illustrated</i>	99
MECONOPSIS CHELIDONIFOLIA. By A. T. Johnson	103
LEUCOSPERMUM MIXTUM. <i>Illustrated</i>	110
SWEET CORN IN ENGLAND. By C. D. R. Dawson. <i>Illustrated</i>	111
FLORISTS' FLOWERS—SWEET PEAS. By J. C. P. M. Davis. <i>Illustrated</i> ...	128
THE PRODUCTION OF ONION SETS. By M. A. H. Tincker and others. <i>Illustrated</i>	135
EXPERIMENTS IN THE USE OF POTATO EYES FOR SEED AT KEW. By W. M. Campbell and Sir Geoffrey Evans. <i>Illustrated</i>	142
A NOTE ON ALBINO FLOWERS. By Eleonora Armitage	146
THE LEOPARD MOTH. By G. Fox Wilson. <i>Illustrated</i>	148
THE ORIGIN OF APPLE 'ELLISON'S ORANGE.' By A. Simmonds	150
MAGNOLIA SARGENTIANA. By Lord Aberconway	159
FLORISTS' FLOWERS—DAHLIAS. By H. Stedwick. <i>Illustrated</i>	160
OUR LAWNS AND THEIR RECONSTRUCTION. By R. B. Dawson	165
THE EXOTIC GARDEN OF MONACO...By Major Pam and V. Higgins. <i>Illustrated</i>	175
RULES GOVERNING TRIALS AT WISLEY	177
THE NAMING OF GARDEN PLANTS	179
EMBOTHRUM COCCINEUM. By Lord Aberconway.....	191
FLORISTS' FLOWERS—THE AURICULA. By K. C. Corsar. <i>Illustrated</i>	192
SOME TREES AND PLANTS IN PALESTINE. By Major F. H. Norris	197
A CHLOROSIS OF TOMATOES. By T. Walsh and E. J. Clarke	202
SPECIMEN ORCHIDS. By E. R. Ashton. <i>Illustrated</i>	208
A NOTE ON CAMELLIAS. By F. J. Chittenden	210
NOTE ON BLIGHT OF OUTDOOR TOMATOES. By D. E. Green and C. T. Thomas. <i>Illustrated</i>	211
TRAINING OF MEN RELEASED FROM WAR SERVICE	215

	PAGE
NEW TYPES OF HYBRID RHODODENDRONS FOR THE SMALL GARDEN. By J. P. C. Russell	225
A GIANT STOCK. By Lewis Palmer. <i>Illustrated</i>	234
SOME RARE ROCK PLANTS. By Dr. P. L. Giuseppe. <i>Illustrated</i>	235
FOUR FRIENDS OF A HUNDRED YEARS. By the Bishop of Truro. <i>Illustrated</i>	238
RIMARIA HEATHII. <i>Illustrated</i>	239
THE ORIGIN OF THE NAME 'GREEN GAGE.' By A. Simmonds	240
LILY NOTES FROM NEW ENGLAND. By W. N. Craig	241
DAHLIAS—A CORRECTION	243
THE AWARD OF GARDEN MERIT—LXXIV	244
SUBSCRIPTIONS: MESSAGE FROM THE PRESIDENT	249
EMBOTHRUM COCCINEUM. By Comd. F. Gilliland	256
IRISES FOR THE LITTLE GARDEN. By Miss L. F. Pesel. <i>Illustrated</i>	257
ROSES AFTER THE WAR. By G. M. Taylor	261
THE AWARD OF GARDEN MERIT—LXXV	270
INSECT PESTS OF COTONEASTER HORIZONTALIS. By G. Fox Wilson. <i>Illustrated</i>	271
DIFFICULT PLANTS FOR THE ENTERPRISING AMATEUR. By D. Wilkie. <i>Illustrated</i>	284
EMBOTHRUM COCCINEUM. By W. Fox	289
LILIES. By R. W. Wallace	291
FLORISTS' FLOWERS—CHRYSANTHEMUMS. By J. Woolman. <i>Illustrated</i> ...	296
ON THE FLORA OF GREECE. By M. Ogilvie-Grant	298
EXPERIMENTS WITH DRIED POTATO EYES. By J. Raine	315
EFFECT OF ARTIFICIAL FROST ON SEED GERMINATION. By Dr. M. Amsler...	316
EMBOTHRUM COCCINEUM FORSTER. By W. Balfour Gourlay	317
FRUIT GROUP EXHIBIT. By N. B. Bagenal	318
VEGETATIVE PROPAGATION OF FLOWERING TREES AND SHRUBS. By F. P. Knight. <i>Illustrated</i>	319
SOME ROSE HYBRIDS. By A. T. Johnson	331
PROPAGATION, DEGENERATION AND VIGOUR OF GROWTH. By M. A. H. Tincker	333
CULTIVATION OF MELONS. By I. W. Read	338
FLORISTS' FLOWERS—THE IRIS. By G. Anley. <i>Illustrated</i>	348
BI-CENTENARY OF WILLIAM CURTIS. By the Bishop of Truro	353
THE CULTIVATION OF RHODODENDRONS. By F. Hanger. <i>Illustrated</i>	355
THE AWARD OF GARDEN MERIT—LXXVI	362
ADDITIONAL NOTE ON ALBINO FLOWERS. By Eleonora Armitage. <i>Illustrated</i>	363
COTYLEDON OPPOSITIFOLIUM	364
EXTRACTS FROM PROCEEDINGS:	
GENERAL MEETINGS AND COMMITTEE REPORTS	xvi, xxv, xxix, xxxiii, xxxvii, xli, xlix, liii, lviii
ANNUAL REPORT FOR 1944.....	i
BALANCE SHEET, 1944	vii
ANNUAL GENERAL MEETING.....	xvii
INDEX.....	lxi

NOTICE TO BINDER.

Volume LXX has been issued in twelve parts, consisting of the "Journal" proper, paged with Arabic figures, and "Extracts from the Proceedings," paged with Roman figures, in Parts 2, 4, 5, 6, 7, 8, 9, 10, 11 and 12. The title and contents should be placed first, and be followed by the twelve parts of the "Journal" proper, with the illustrations in the centre in each case, and then the ten parts of the "Extracts from the Proceedings."

the Society's New Hall, when Mr. W. J. HEPBURN will talk on "The Herbaceous Border."

Distribution of Seeds.—The form of application and the list of seeds for distribution in 1946 will be circulated in the January JOURNAL. The distribution will be made only to Fellows whose subscriptions for the year 1946 have been received.

R.H.S. Gardeners' Diary, 1946.—The Society's supply of Diaries is now exhausted.

Curtis Museum.—The Curtis Museum at Alton, Hampshire, is arranging to hold an Exhibition on January 11, 12 and 14 in celebration of the bi-centenary of the birth of WILLIAM CURTIS, F.L.S. (1746-1799), author of *Flora Londinensis* and founder of the Botanical Magazine, who was born at Alton. Mr. JOHN S. L. GILMOUR, F.L.S., Assistant Director of the Royal Botanic Gardens, Kew, has promised to open the Exhibition at 2.30 P.M. on Friday, January 11, 1946.

Memorial Service.—In connection with the unveiling of the restored headstone of WILLIAM CURTIS at Battersea Parish Church, a memorial service will be held at 11 A.M. on Sunday, January 13, 1946, the Sunday nearest to the two-hundredth anniversary of CURTIS's birth. (See p. 353).

Publication.—The *National Fruit Trials*, being the report of the work done at Wisley from 1921 to 1944, is now available, and can be obtained from the Secretary, price 5s., post free.

Journal.—From January 1, 1946, the cost of the JOURNAL to non-Fellows will be increased to 3s.

Editorship.—The Council have appointed Major PATRICK M. SYNGE, M.A., as Editor of the JOURNAL and other publications of the Society, in succession to Mrs. VERA HIGGINS, who has filled the post during the war period. Major SYNGE has recently been released from the Army and will take up his new duties immediately.

WISLEY IN DECEMBER.

MOST of the plants flowering this month will be found in the glass-houses, and the more important of these were mentioned in our notes for November; but unless the weather is unusually bad there will be flowers on a few shrubs growing outside. Pre-eminent among these is *Mahonia japonica*, a noble woodland plant now opening sweetly-scented, primrose-yellow blossoms set off by bold, evergreen foliage. This may be seen in good condition both in the Wild garden and in the dell on Battleston Hill, where it enjoys shelter from hot summer sunshine. The hybrid *Arbutus andrachnoides*, which inherits a winter-flowering tendency from its parent, the 'Strawberry Tree,' is represented by a large specimen on the north side of Seven Acres.

In the adjacent Heath garden the earlier varieties of *Erica carnea*, such as the rich pink 'Queen Mary,' and the invaluable hybrid *E. darleyensis*, have already opened the first of a long succession of flowers. The accommodating tolerance of lime in the soil shown by members of this group enables them to be successfully cultivated in gardens where most other Ericaceous plants fail to thrive. In the same part

of the Gardens there is a tree of *Prunus subhirtella* var. *autumnalis* which will probably show a sprinkling of frail, pink flowers, although its most abundant display is not to be expected until early spring. *Viburnum fragrans* was in full bloom this year by mid-October before many of its bronze-tinted leaves had fallen, and the larger-flowered *V. foetens*, usually not at its best until Christmas, behaved in a similar manner. Even more remarkable precocity was noticeable in some bushes of *V. tomentosum* var. *Mariesii*, which produced a considerable autumnal crop of flowers.

Cotoneasters are prominent among the shrubs still bearing coloured berries. In Seven Acres and Howard's Field there are large specimens of late-ripening species such as *C. lactea*, forming dense, leafy bushes, *C. glaucophylla* and the closely-related *C. serotina*, with smaller foliage and more open habit, *C. frigida*, whose branches are weighed down by their heavy, crimson clusters, and *C. salicifolia* var. *floccosa*, an attractive small tree with nicely disposed leaves and small, shining berries. The Pyracanthas are equally decorative, but birds are fond of the fruits and devour them greedily. The yellow-fruited *P. angustifolia* seems least liable to attack, and often retains its crop until March.

Brightly coloured bark, sometimes striped or marked by conspicuous lenticels, is a feature of the many trees and shrubs. Some Maples, Dogwoods and Birches are noteworthy in this respect, and the brown, suede-like stem of *Arbutus Menziesii* is particularly striking. In the Pinetum, as in the Wild garden and in the collection to the south of the glasshouses, there are some good specimen conifers, whose varied forms and colouring are most appreciated when other trees and shrubs are leafless. In the Rock garden and among the Heaths there are many examples of the dwarf forms so well suited to these surroundings, and of especial value while flowers are scarce.

The first half of the season now ending was marked by somewhat violent extremes of weather. The cold January usefully retarded the growth of some of the earlier shrubs, but inflicted damage upon others, such as *Acacia dealbata*, *Fremontia mexicana* and *Cytisus Battandieri*. *Buddleia auriculata*, against a south wall, was killed outright. The warm, sunny spells of March and April hurried on the show of Saxifrages and early bulbous plants in the Alpine house and encouraged the Forsythias and Lilacs to open to perfection. By mid-April many Rhododendrons were flowering, including the lovely 'Calrose' and other distinctive Griersonianum hybrids. At the same date *Viburnum bilchiuense* flowered more profusely than ever before, and *V. Juddii*, a hybrid raised at the Arnold Arboretum in 1920 from a cross between this and *V. Carlesii*, again demonstrated its first-rate qualities.

Severe frost and snow at the end of the month once again impaired the display of Azaleas in the Wild garden, also shrivelling the young Magnolia foliage, including that of *M. Wilsonii*, just opening its first flowers. *Telopea truncata*, the 'Tasmanian Waratah,' showed contempt for spring frosts by flowering a week later, for the first time at Wisley.

June-flowering shrubs were, on the whole, most satisfactory. The Roses, Cistus, and Helianthemums provided a very gay show in Howard's Field; Mock-oranges, Brooms, Escallonias and Spiraeas maintained the interest of the Seven Acres collection; and the later Rhododendrons on Battleston Hill attracted a good deal of attention. Quite the most lovely object in the Gardens at this time was the

specimen of *Hoheria Lyallii* var. *glabrata*, the 'Lace Tree' of New Zealand, growing against the north side of the frame-yard wall, every branchlet densely wreathed with white flowers.

Comparatively few additions have been made during the war years to the collections of tender plants in the Temperate and Half-hardy houses, but, despite fuel restrictions and shortage of labour, they have continued to produce a succession of uncommon flowers. The following have been particularly good this year. *Sutera grandiflora*, a semi-shrubby South African plant with small, elliptic, toothed leaves and sprays of five-petalled, lavender flowers an inch across, somewhat resembling *Verbenas*, opening in succession for at least five months; *Sphaeralcea Fendleri*, a small, bushy plant of the Mallow family with greyish, downy leaves and very numerous flowers varying from coral to the Shrimp Red of the Horticultural Colour Chart, also with an extending flowering season; *Moraea iridioides*, a South African Iris-like plant with stiff, evergreen leaves and tall stems periodically producing a crop of fugacious white flowers; and *Clematis nannophylla*, a Chinese species forming a mass of branched stems about a yard high, bearing pinnatifid, toothed leaves and, in October, many small, four-petalled yellow flowers.

GARDEN WORK.

REMINDERS FOR DECEMBER.

Vegetable Garden.—Draw up in good time a scheme for cropping the vegetable garden; a carefully thought out plan avoids waste of space and unnecessary labour.

Consult the seed catalogues and order the necessary seeds early. Keep generally to those varieties of proved merit, but a few novelties might be given a trial.

At this time of the year attention can be given to any necessary draining of the land; the outlets of existing drains should be inspected and cleared, if necessary.

Push on with the digging of vacant land whenever conditions are favourable. When the ground is frostbound seize the opportunity to wheel manure or garden compost to the place where it will be wanted when digging can be resumed.

July-sown Beetroots and Carrots should now be lifted and stored except where the soil is favourable for leaving them in the ground; in the latter case it will be advisable to have covering at hand in case of severe frost.

Protect Celery with straw or bracken and increase the protective material of Potatoes both in sheds and clamps during spells of severe frost. Late maturing Broccoli will stand the above mentioned weather conditions better if the plants are heeled over to face the north.

In anticipation of heavy falls of snow or periods of prolonged frost it is advisable to lift a small quantity of Celery, Leeks, Parsnips, etc., and place in some accessible place under cover, such as a shed or cold frame.

In order to produce a supply of Rhubarb earlier than that grown naturally, select a few strong crowns in the established bed and cover each with one of the pots specially made for this purpose; a box or

barrel from which the bottom has been detached can be substituted. When using boxes or barrels these can be inverted over the crowns replacing the loose bottoms before covering the whole with long strawy manure or similar material. This method makes it easy to inspect or gather the crop without disturbing the protective covering.

Take stock of garden tools, spraying apparatus and mowing machines. Give attention to any repairs and necessary replacements so that all will be in order when required.

Fruit Garden.—If for any reason the planting of fruit trees and bushes has been delayed, endeavour to complete this operation before the end of the year. If not already finished push on with fruit tree pruning and the training of fruit trees on walls on all favourable occasions ; this is usually pleasant and interesting work at this season, later it is apt to be otherwise. Burn all prunings and store the ash in a dry place.

The present is a good time to thin out the spurs of old Apple and Pear trees, especially cordon and espalier trained trees. It is work that will be well repaid if a number of spurs are completely removed and some of the remaining ones shortened ; this will have the effect of reducing the competition for food and the retained buds will be considerably strengthened with consequent good effect upon the fruits and general health of the trees.

The soil in which wall trees are growing often becomes sour and exhausted, with resultant unfavourable effect upon the trees. In such cases remove the top inch or two and replace with a compost made up of well rotted turf to which a little bonemeal and wood ash have been added.

If required, select scions of the desired varieties of fruit trees and "heel in" in a shady position as a means of retarding them in readiness for grafting the following spring.

Before the end of the year choose favourable weather conditions for spraying the trees of Apricots, Cherries, Peaches, Plums, also Gooseberry and Currant bushes with a Tar Oil Wash.

Examine greasebands on fruit trees and remove any foreign matter which has accumulated and renew the grease if necessary.

Periodically examine fruits in store and remove all decayed fruit however slightly affected. Pears need frequent inspection in order to use or dispose of them before they become "sleepy." Much fruit is wasted in this manner every year.

Flower Garden.—Favourable conditions prevailing, continue to plant deciduous trees and shrubs also Roses (should this operation not be completed). A mulch of straw or bracken is recommended in the case of specimen trees and shrubs planted at this time of the year ; this has the effect of protecting the roots from frost and prevents undue loss of water in the spring.

Examine shrubs and remove dead wood or suckers which may be present, pruning those needing it at this time of the year. Most shrubs benefit from a top dressing of leaf mould or alternatively this year's leaves can be collected and placed over the rooting area ; Rhododendrons particularly appreciate this treatment ; a little loose soil scattered over the leaves will hold them in position.

Examine hedges, especially evergreen ones and Yews in particular, and remove any accumulation of leaves which might be trapped in the forks of the branches. Make certain that the soil is free from weeds or encroaching plants and if the state of the hedge requires a little

assistance in the way of feeding, a good dressing of bonemeal should prove effective.

Remove fallen leaves from rock garden plants and place sheets of glass over those needing protection from heavy rains. Cover Christmas Roses with a frame or hand light to ensure clean flowers. Gather buds of *Iris stylosa* (*unguicularis*) before they are fully expanded and place in vases in the house.

Where slugs are known to be troublesome protect Delphiniums, Lupins and Pyrethrums by placing a good layer of old sifted ashes over their crowns.

Severe damage can often be prevented if evergreen shrubs and trees weighed down by heavy falls of snow are gently shaken and freed from their canopy.

Cold Houses and Frames.—During a mild autumn Cauliflowers planted in frames are liable to grow too vigorously, in which case it will be an advantage to check growth by lifting and replanting, spacing the plants at slightly greater distance. Should the plants be wintering in small pots (a good method of wintering these plants) it will be advisable to move and rearrange them occasionally to prevent the roots penetrating into the bottom of the frames.

To provide young shoots in the new year for flavouring, place roots of Mint, Tarragon and Chives under glass. Continue to introduce batches of Chicory, Rhubarb and Seakale to glasshouses or frames for forwarding, also cover Endives for blanching.

Lose no opportunity to give plenty of air to plants in houses and frames whenever weather conditions allow; Cabbage Lettuces for forcing are an exception to this rule.

Release the shoots of Peach and Nectarine trees from the wires and remove any surplus shoots which were overlooked at the time of pruning. After first cleaning the house, spray the trees with a 5 per cent. Tar Oil Wash before re-tying the shoots about 3 inches apart. Replenish the border soil by removing the top inch and replace this with a top dressing made up of good turfy loam to which a little bonemeal and wood ash have been added. Maintain the maximum ventilation.

Prune Grape Vines immediately the leaves have fallen in order to reduce the risk of bleeding, cutting the laterals back to two buds and shortening the leaders according to strength and requirements. Should Mealy Bug have been troublesome the loose bark only should be removed before spraying with a Tar Oil Wash. Treat the border soil in the same manner as advocated for Peach trees and top dress with a similar compost with the addition of a little well rotted manure.

FLORISTS' FLOWERS.—VII.

THE IRIS.

By GWENDOLYN ANLEY.

THE story of the Iris is a long one, possibly longer than that of any other flower. Somewhere about 1500 B.C. the Pharaoh THOTHMES III cultivated a "Syrian Garden" in which he grew plants collected on his expeditions into Syria. A *bas relief* of the period showing the plants collected by the Egyptian invaders depicts two Irises with large standards and small recurved falls characteristic of the *Oncocyclus* section. This is the earliest known representation of the Iris. Some botanists contend that when we are bidden to "consider the lilies" it is to the Irises that we should turn our eyes. No Lilies grow in the Holy Land, whereas *I. cypriana*, *I. albicans* and *I. Madonna* abound in the fields, therefore this contention is not unreasonable. There is something which grips the imagination as the long history unfolds, and one cannot fail to be impressed by the close human association the plant has always had. Through the ages men have made use of it in medicine, perfumery and many other ways in their domestic life, whilst to-day it is undoubtedly one of the favourite and most beautiful flowers in our gardens.

The Iris occurs only in the Northern Hemisphere. Its distribution is very wide, and it is doubtful if any other genus is to be found in four out of five continents or under such diverse conditions, both climatic and regional. It thrives just outside the limit of the Arctic ice-fields and in the rich alluvial mud of Louisiana. In Yunnan it makes its home 12,000 feet above sea level, while in the Levant it descends to within a few feet of the Mediterranean. From Hudson Bay to Texas it flourishes in swamps and streams which never dry up, but in Asia Minor it sends up six foot stems in marshes which become parched deserts in the dry season. In the woodlands of Japan, on the perpendicular limestone cliffs of Dalmatia, in the salt marshes of Central Asia, on the peaks of Persia and Syria, in the fields of Palestine and on the banks of quiet English streams, such are the widely divergent stations and conditions in which the Iris flourishes.

It was as a medicinal plant that the Iris was originally prized and it would appear that seldom has any single plant been used as a specific against so many and diverse ills. In the sixth century DIOSCORIDES, a Greek physician, mentions many ailments which could be cured by its uses. It was said that by its use in one form or another diseases of the chest could be cured, freckles removed, the pains of childbirth eased, insomnia overcome, colic relieved, the poison of snake-bite counteracted and ulcers cleansed and filled with healthy flesh. As late as 1551 WYLLIAM TURNER, "Physician unto the Duke of Somersette's Grace" gives directions in his *New Herbal* for drying and storing the rhizomes and advises that "The broth of it, if it be sodden wyth wyne, fasteneth louse teth if the mouth be washed therewyth." To-day the only known drug derived from the Iris is Blue Flag, the source of which is the poisonous *I. versicolor*, a native of the Eastern United States. The drug is seldom, if ever employed

now-a-days, but is still listed in the "Extra British Pharmacopoeia,"—a work which lists rare and little known drugs.

PLINY, who fully agreed with DIOSCORIDES as to the medicinal value of the plant, gives most elaborate directions for the gathering of the root which involved the scattering of honey water for three months beforehand "to appease the earth with flattery." It was necessary too, to mark "a threefold circle with the point of his sword" about the plant, which, after digging, must be raised to heaven. This ritual, which seems to have been widely observed by the ancient herbalists and apothecaries, may owe its origin to the fact that the fractured root of *I. florentina*, the usual source of Orris root, shows phosphorescence if it is dug by night—a phenomenon as mysterious as it was miraculous in those unenlightened days.

In the third century Orris Oil was amongst the rare spices of the Kings of Egypt and later, in the time of DIOSCORIDES, both the Greeks and the Romans used the rhizomes in perfume as well as in medicine, and Macedonia and Carinthia were famous for their perfumed ointments. During the reign of EDWARD IV of England it is recorded that a popular toilet water was prepared from Orris root and Anise. The comparative unfamiliarity of what might be described as high society—to use the *mot juste*—with the use of soap and water at that period may possibly account for the popularity of this toilet lotion.

Germs were undreamed of and the simplest laws of hygiene unknown in those far-off days. Infants cut their teeth on Orris root fingers and if anything more unhygienic than these "Dentarnole" can be imagined it is to be found in "Issue peas." It was then generally believed that an open, running sore would cure Scrofula and similar skin diseases. Orris beads or "Issue peas" were greatly in demand in this connection, a pea being bound into the sore to keep it open. This "cure" persisted as late as the nineteenth century when, incredible as it may seem, twenty million peas were shipped annually from the port of Leghorn; by 1912 the annual export had dropped to a mere four million. It would be interesting to know the destination of these peas. The writer, when a child, frequently witnessed the natives of Ceylon binding some small round object into open sores. It is quite possible that these shipments were destined for the East where such diseases were rife and hygiene totally ignored.

Orris root also furnished beads for rosaries, coloured grains for burning and perfuming rooms, chips for menservants to chew to remove the smell of garlic and tobacco, and powder for use when washing linen as well as in the linen presses. Some wines owed their bouquet to Orris and it was even used in cooking. A pigment called Verdelis or Iris Green was made from the flowers of *I. florentina* and was at one time favoured by artists but, like other colours obtained from plants, it was of a fugitive nature and was soon discarded in favour of a permanent inorganic pigment.

It was no doubt due to the violet-scented Iris root that, when describing its culture, an Arabian agriculturist writes of "the Violet Lily" in the twelfth century. Later another Arabian, IBN-EL-BEITHAR, a physician, after enumerating its many medicinal virtues, states that "Irisa is the Violet Lily." It seems possible that the mistake made by these two Arabians was also made in France about the same time. From 1180 in the reign of LOUIS VII the Iris was used on the escutcheon of the King of France as well as by some families of the French aristocracy. This, often referred to as "the Lilies of France," has been

identified as *I. pseudacorus*, but it has never been definitely established whether this was named "Fleur-de-lis" (flower of the lily), "Fleur-de-Lys" (flower of the Lys, on the banks of which river *I. pseudacorus* grew in great profusion), or "Fleur-de-luce" (flower of light, in reference to its golden colour). The Fleur-de-lis was also borne for several centuries on the arms of England and, in connection with the many defeats of the armies of HENRY VI in France, Shakespeare wrote :

"Cropped are the flower de luces in your arms ;
Of England's coat one half is cut away."

Eton College, founded by HENRY VI, flies the Plantagenet Standard to this day and the same emblem is still displayed on the arms of the College.

Longfellow wrote :

"Oh flower-de-luce, bloom on and let the river
Linger to kiss thy feet ;
Oh flower of song, bloom on and make for ever
The world more fair and sweet."

But oddly enough, in spite of its beauty of form the Iris has never proved a "flower of song," and has never taken its place alongside the Rose, Lily and Violet in verse or song.

On the other hand it has always made a great appeal to artists, possessing as it does a decorative, architectural and heraldic value unsurpassed by any other flower. Many of the old Dutch and Italian masters show Irises, not only in their flower groups but also in pictures concerned with the early life of Christ, where this flower was used as a sign of His royal birth. The "Adoration of the Magi" by FABRIANO in the Uffizi Gallery shows an Iris in the margin, and another picture under the same title, by VAN DER GOES, shows both a white and a purple Iris. LEONARDO DA VINCI'S "Madonna of the Rocks" in the Louvre, and at least two religious pictures, which in normal times are to be seen in the National Gallery, show this flower. Ancient and modern art in China and Japan, whether embroideries, paintings, cloisonné, lacquer or carved Jade all prove the appeal of the Iris to these masters of restrained art. In a shabby back street of Kyoto stood the temple of Nishi-honganji, and here was housed one of the choicest treasures of Japan—a magnificent pair of six-panelled screens depicting Irises painted by a famous master of decorative art in the seventeenth century.

There is no garden where Irises of some kind cannot be successfully grown, whether the soil be light or heavy, moist or dry, sun-baked or partly shaded, calcareous or lime-free, and so accommodating is the family that many of the water-lovers will thrive quite contentedly on dry land. A criticism frequently levelled against the family is that their season is so short. This is usually made by those who are familiar only with the bearded garden varieties. It certainly is not generally recognised that, by careful selection from the species, it is possible to have Irises in flower for ten months of the year.

The development of the tall bearded Iris of gardens, as we know it to-day, was slow. The first record of raising these plants from seed is mentioned by CLUSIUS in 1601. LÉMON was the first nurseryman to take up Iris growing seriously, but as late as 1840 all his seedlings were the result of chance and not of deliberate crossing. Even so,

for half a century LÉMON's seedlings formed the nucleus of all collections. From 1870 English raisers came to the fore and ROBERT PARKER, PETER BARR and THOMAS WARE put out many new varieties. About 18 years later the use of *I. Ricardi* and *I. trojana* as parents infused new blood into the hybrids and new interest into breeding. Such names as VILMORIN, ANDRIEUX ET CIE., the VERDIERS, father and son, CAYEUX ET LE CLERC, MILLET ET FILS, and the amateur DENIS became famous amongst Iris growers of the period. But it is to Sir MICHAEL FOSTER that we owe the greatest advance in the knowledge of Iris breeding. He made many valuable experiments in hybridising, kept careful notes and collected much information on the subject, all of which has been a guide to those who have followed after him. It was he too, who introduced the blood of *I. cypriana* and *I. mesopotamica* into the strain of garden Irises, and he has truly been named "the Father of Iris growing." DYKES, HORT and BLISS all raised Irises of considerable merit, the latter doing much to raise the tall bearded varieties to the high level they now occupy by the introduction of his outstanding 'Dominion,' the influence of which was soon apparent in the offspring. Nor must we forget the work of G. P. BAKER, G. N. BUNYARD, AMOS PERRY and R. W. WALLACE, all of whom have given us many beautiful varieties which are still being grown to-day. BERTRAND FARR was the first man in the States to take up Iris breeding seriously. MOHR and MITCHELL worked in partnership until the tragic death of the former. They produced many fine varieties which have influenced the modern strain, notably the beautiful 'Purissima.' Since the death of MOHR, Professor SIDNEY MITCHELL has continued his work along the same lines and has given us some lovely hybrids. The raising of tall bearded seedlings in America has reached an amazing volume, 100,000 per annum is the figure given, but only a small proportion of these are even seen outside the garden of their origin. The War has put a brake on the activities of our English raisers whose numbers cannot compare with those of America. But every year sees at least a few new varieties put out by B. R. LONG, Canon ROLLO MEYER, CEDRIC MORRIS, OLIVE MURRELL and R. E. S. SPENDER. No doubt in the near future many new names will be added as normal conditions reassert themselves. Many new and beautiful flowers which are not yet in commerce are to be seen in a few private gardens, but these are not likely to be generally available for some time. The following modern varieties, which can be thoroughly recommended, should all be available, though possibly in short supply, in the coming season.

White. 'Benton Pearl' (MORRIS), 'Mount Cloud' (MILLIKIN), 'White City' (MURRELL).

Pale Yellow. 'Blithe Spirit' (LONG), 'Fair Elaine' (MITCHELL), 'Snoqualmie' (BREHM).

Bright Yellow. 'Golden Majesty' (SALBACH), 'Joan Lay' and 'Mabel Chadburn' (CHADBURN).

Orange. 'Benton Hadleigh' (MORRIS), 'Orange Flame' and 'Radiant' (SALBACH).

Pale Blue. 'Great Lakes' (COUSINS), 'St. Osyth' (MEYER) 'Windermere' (LONG).

Mid Blue. 'Gainsborough' (BUNYARD), 'Blue Ensign' (MEYER), 'Sierra Blue' (ESSIG).

Violet Blue. 'Black Wings' (Kirkland), 'Mata Hari' (NICHOLLS), 'Requiem' (SPENDER).

Blue Bicolours. 'Warwick' (BUNYARD), 'Winnesheik' (EGELBERG).

Crimson Tones. 'Blood Carnelian' (LONG), 'St. Julien' (MEYER).

Chestnut. 'Christabel' (LAPHAM), 'JUNALUSKA' (KIRKLAND).

Rose Red. 'Lighthouse' (SALBACH), 'Rosy Wings' (GAGE).

Lavender. 'Nina Levett' (LEVETT).

Pink. 'Alastor' (SPENDER), 'Edward of Windsor' (MORRIS), 'Rose of England' (LONG).

Brown. 'Bulwark' (LONG), 'Louvois' (CAYEAU).

Amœnas. 'Amigo' (WILLIAMSON), 'Gwendolyn Anley' and 'Hy-cilla' (LONG).

Blends. 'Childhood' (LONG), 'Prairie Sunset' (H. P. SASS), 'Shot Silk' (MURRELL).

Plicatas. 'Benton Baggage' and 'Benton Duff' (MORRIS).

Variegatas. 'Eternal City' and 'High Command' (LONG).

The foregoing list contains the names of the most up-to-date varieties which are available to-day, but there are many old favourites still worth growing and which are not likely to be discarded yet awhile. Two of the oldest are indispensable, 'Corrida' (MILLET), china blue, and 'Sweet Lavender' (BLISS). Though in both cases the flowers are small according to modern standards they are quite charming and, when used freely in a mixed collection, they give life and sparkle to the picture and pull the whole colour scheme together.

Cultivation presents few difficulties. Practically every type of soil except wet, boggy ground can be made suitable and the plants will do well provided two simple rules are observed; (a) drainage must be perfect and (b) the site should be in full sun for the greater part of the day. Planting should be carried out with the least possible delay after flowering. The old roots will then have completed their function while the new ones will not yet have begun to grow. When it is realised that the new roots will grow as much as eighteen inches in a fortnight the need for haste in planting will be readily understood.

Many growers consider that lime is an essential for success, but actually this is not so. Irises do equally well whether the soil has a lime content or is lime free. Old kitchen garden soil, which has been well cultivated, is ideal but not always obtainable. Heavy clay soils must be deeply dug and plenty of coarse sand, unscreened bonfire ash, old mortar rubble, or any other material which will lead to good drainage should be incorporated. Body must be given to light soils by the addition of vegetable humus, such as well rotted garden refuse, coarse leaf-mould, granulated peat or spent hops. Except in the case of neglected and very poor soil no stable or farmyard manure should be used. If it is employed at all it must be exceedingly sparingly, otherwise soft, lush growth will result and the plants will fall easy prey to Stem and Rhizome Rot. Whenever possible Iris beds should be raised three or four inches above normal ground level. This undoubtedly is a safeguard against all forms of soft rot diseases.

It is not generally recognised that the rhizome is actually a creeping stem and not the root. If it is treated as the root and planted below the soil much of the energy of the plant will be expended in bringing this stem up to the surface, where it can receive the baking it demands if it is to flower freely. The foliage should be cut to a height of six inches at the time of planting and the foliage of established plants should be cut down to a similar height at the end of August. Besides admitting all possible sun to the rhizome this will usually prevent a serious outbreak of Leaf Spot in autumn.

Irises give generously and in return ask for generous treatment. When replanting the beds, say, every two or three years according to the growth the plants have made, plenty of good vegetable compost should be worked into the soil to replace what has been taken out. A light dressing of compost should also be worked in each year after flowering and bone meal should be given at the rate of two ounces per square yard in July and early February.

Illustrations Figs. 106-109.

THE BI-CENTENARY OF WILLIAM CURTIS.

By THE RT. REV. J. W. HUNKIN, Bishop of Truro.

WILLIAM CURTIS was born at Alton in Hampshire on January 11, 1746. He was one of the most competent and enthusiastic naturalists of the eighteenth century, and is best known to history as the founder of *The Botanical Magazine*. The first number appeared on February 1, 1787, and the publication has continued right down to the present time, the latest volume published being Vol. 164, 1944, and the last of the long series of hand-coloured plates being number t. 9666.

The first volume is dedicated to Mrs. MONTAGU BURGOYNE :

To
MRS. MONTAGU BURGOYNE
not less esteemed
for her
Social and Domestic Virtues
Than admired for the
Accuracy with which she paints
THE
BEAUTIES OF FLORA,
This attempt to unite
SYSTEMATIC KNOWLEDGE
With the Pleasures of the
FLOWER-GARDEN
is with the
sincerest respect
inscribed by
WILLIAM CURTIS.

This Mrs. MONTAGU BURGOYNE was a daughter of Sir ELIAB HARVEY, who was Captain of the *Fighting Temeraire* of ninety-eight guns, second ship of the weather-line at Trafalgar, closely following the *Victory*, and his share in the action was particularly brilliant. Mr. MONTAGU BURGOYNE, her husband, held a sinecure office in the Exchequer, and was for many years Verderer of Epping Forest. He was much interested in the allotment system, and published a collection of Psalms and Hymns. The marriage was outstandingly happy, and Mr. and Mrs. BURGOYNE were said to have qualified for the Dunmow flitch of bacon.

An interesting account of the history of *The Botanical Magazine* from 1787 to 1904 by W. BOTTING HEMSLEY was published in the Index

Volume of 1906. The story was continued in a valuable article in this JOURNAL by O. STAFF in 1926—"The Botanical Magazine: its history and mission."

Since the latter date, among the foremost subjects dealt with in the Magazine have been the beautiful plants introduced from China by GEORGE FORREST, E. H. WILSON, KINGDON WARD and other travellers. The Magazine still confines itself to species, and the plants are still hand-painted.

For the personal history of the founder it must suffice to refer to the authoritative and exhaustive biography published in 1941 by Mr. W. HUGH CURTIS, Curator of the Curtis Museum, Alton. There are two little memorials to him in London. One is a plaque of blue encaustic on the wall of the tall building in Gracechurch Street which occupies the site of the house where CURTIS carried on his business as an apothecary. The inscription reads :

"In a house on this site lived WILLIAM CURTIS, Botanist,
B. 1746—D. 1799."

Happily this plaque was not damaged during the bombings of the recent war.

The other memorial is the tombstone in the old churchyard of Battersea Parish Church. The original inscription has been entirely weathered away, but recently the Streatham Historical and Archaeological Society has identified the stone. Arrangements are now being made to renovate the stone and restore the inscription.

A further memorial is proposed : the conversion of this small disused churchyard into a quiet corner of grass and flowering shrubs, with a few seats along the river. CURTIS chose the spot for its beauty, and, indeed, situated as it is at a bend of the river, it has great possibilities. It should not be difficult to obtain a Faculty for the placing of the existing gravestones along the wall, and for levelling, grassing and planting. Such a God's Acre of green and blossom would be very thankfully welcomed in that industrialized neighbourhood.

The original inscription on the tombstone was as follows :

"Here are deposited the remains of Mr. WILLIAM CURTIS, Author of the *Flora Londinensis*, and the *Botanical Magazine*, and other works highly serviceable to his country, and honourable to himself.

He died 7th July, 1799, aged 53 years.

While living herbs shall spring, profusely wild,
Or garden cherish all that's sweet and gay ;
So long thy works shall praise, dear Nature's child,
So long thy memory suffer no decay."

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

SEPTEMBER 11, 1945.

FLORAL COMMITTEE B.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. R. C. Notcutt, The Nursery, Woodbridge, Suffolk.

To Messrs. J. Cheal & Sons, Ltd., The Nurseries, Crawley, Sussex.

To Mr. K. W. Harlo, Stone House, Lower Basildon, Berks.

Silver Flora Medal.

To Mr. Ernest Ladhams, Elstead Nurseries, Godalming, Surrey.

Silver Banksian Medal.

To Messrs. R. L. Russell, Ltd., Richmond Nurseries, Windlesham, Surrey.

Flora Medal.

Messrs. John Waterer, Sons & Crisp, Ltd., The Nurseries, Bagshot, Surrey.

To Messrs. Orchard Neville Nurseries Ltd., Baltonsborough, Somerset.

Lindley Medal.

To G. H. Berry, Esq., The Highlands, Ridgeway, Enfield, for an exhibit of Gentian hybrids.

Award of Merit.

To *Coprosma parviflora*, as a hardy berried shrub (votes unanimous), shown by Major E. de Rothschild, Exbury, Southampton. See p. 367.

Other Exhibits.

Caryopteris × *clandonensis*, shown by Iris, Lady Lawrence, Springwood, Godalming.

Fuchsia 'Lord Lonsdale,' shown by C. J. Howlett, Esq., The Yews, 309 Wokingham Road, Earley, Reading.

Sorbus cuspidata, shown by Capt. Collingwood Ingram, Benenden, Kent.

Berberis vulgaris var. *asperma*, shown by R. D. Trotter, Esq., Leith Vale, Ockley, Surrey.

Pyrus 'Roseland's Seedling,' a seedling from *P. Eleyi*, shown by E. S. Rashleigh, Esq., Roselands, Enfield.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and nine other members present.

Award Recommended :—

Award of Merit.

To *Doritis pulcherrima* var. 'Verulam' (votes for 6, 0 against), from Messrs. Sanders, St. Albans. See p. 368.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. E. F. HAWES, in the Chair, and eight other members present.

Awards Recommended :—

Award of Merit.

To 'August Glory,' as an exhibition variety (votes 6 for, 2 against), shown by Messrs. Johnson (Florists), Ltd., Forge Nurseries, Burton-on-Trent. See p. 366.

To 'Hyde,' as an exhibition variety (votes 7 for, 0 against), shown by Mr. A. B. Hyde, Eastmoor School, Adel, Leeds. See p. 367.

To 'Treasure,' as an exhibition variety (votes 7 for, 0 against), shown by Messrs. J. & E. Maher, Carisbrooke, South Road, Hampton, Middlesex. See p. 367.

To 'Radar,' 'Fire Drake,' 'Arnhem' and 'Diane,' as exhibition varieties (votes 6 for, 0 against in each case), all shown by Messrs. J. & T. Johnson, Tibshelf, Derbys. See pp 366, 367.

Selected for trial at Wisley.

'August Glory' and 'Orange Gem,' shown by Messrs. Johnsons (Florists), Ltd., Burton-on-Trent.

'Hyde,' shown by Mr. A. B. Hyde, Eastmoor School, Adel, Leeds.

'Treasure,' shown by Messrs. J. & E. Maher, Carisbrooke, Hampton, Middlx.

'Radar,' 'Madaline,' 'Fiancée,' 'Kremlin,' 'Edensor,' 'Diane,' 'Arnhem' and 'Firedrake,' all shown by Messrs. J. & T. Johnson, Tibshelf, Derbys.

Other Exhibits.

'Egerton' (A.M. August 14, 1945), sent by Mr. G. Lamb, Egerton Nursery, Hextable, Swanley, Kent.

'Golden Fairy,' from Mr. E. Bishop, 313 St. Leonards Road, Windsor.

'Mauve Princess,' 'Innocence' and 'Emperor,' from Messrs. Johnsons (Florists), Ltd., Burton-on-Trent.

'Eastmoor Red,' syn. 'Copper Utopia,' from Mr. A. B. Hyde, Adel, Leeds.

'Alfreton Delight' and 'Alfreton Sunrise,' from Mr. E. Riley, Brookside Nurseries, Alfreton, Derbys.

'Edale,' 'Fondant,' 'Sunbronze' and 'Moonstone,' shown by Messrs. J. & T. Johnson, Tibshelf, Derbys.

'Oceanic' (at Wisley) and 'Everest,' shown by Mr. H. Woolman, Shirley, Birmingham.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

Award of Merit.

To Dahlia 'Betty Holmes' as an exhibition variety (votes 8 for, 0 against), shown by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea. See p. 367.

To Dahlia 'Charlotte Collins' as an exhibition variety (votes 8 for, 0 against), shown by Mr. Stuart Ogg, Grove Nurseries, Swanley. See p. 367.

To Dahlia 'Marian Tate' as an exhibition variety (votes 8 for, 0 against), shown by Messrs. J. Stredwick & Son, St. Leonards-on-Sea. See p. 367.

Selected for trial at Wisley.

'Fairholme,' 'Peach Glow,' 'Peach Queen,' 'Rosary,' 'Sunlight,' from Mr. J. F. Barwise, Towneley Nurseries, Burnley.

'Bettabracht,' 'Sweetness,' 'Tyne,' from Messrs. Brown & Such, Ltd., Royal Berkshire Nurseries, Maidenhead.

'Dainty Rose,' from Messrs. Carter Page & Co., 52 London Wall, London, E.C. 2.

'Anne Lister,' 'Jean Lister,' from Messrs. Alex. Lister & Son, Rothesay.

'Charlotte Collins,' 'Evelyn Ogg,' from Mr. Stuart Ogg, Grove Nurseries, Swanley.

'Blazon,' 'Betty Holmes,' 'Cease Fire,' 'Doreen Blackman,' 'Edith Morrell,'

'Marion Tate,' 'Melody,' 'Waterlily,' 'W. D. Cremer,' from Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea.

Dahlias were also submitted by Mr. E. J. Barker, Ipswich; Mr. A. T. Barnes, Bedford; Messrs. J. Cheal & Sons, Crawley; Messrs. E. Cooper & Son, St. Albans; Mr. T. C. Evans, Chelmsworth Hall, Suffolk; Messrs. E. F. Fairbairn & Sons, Carlisle; Mr. A. Griffiths, London; Mr. W. D. Green, Stamford; Mr. G. Malin, Hinckley; Mr. D. Newby, Newchurch in Rossendale; Mr. F. Pye, Ferndown; Mr. N. G. Smith, Potters Bar; Mr. J. S. Wallis, Histon.

JOINT ROCK-GARDEN PLANT COMMITTEE.—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Award of Merit.

To *Gentiana* 'Orva' (*G. ornata* × *G. Veitchiorum*) (votes unanimous), shown by G. H. Berry, Esq., The Highlands, Ridgeway, Enfield. See p. 368.

Preliminary Commendation.

To *Gentiana* hybrid (*G. ornata* × *G. Veitchiorum*) (votes unanimous), shown by W. L. Lead, Esq., 4 Park Lane, Hayfield, Stockport.

SEPTEMBER 25, 1945.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and six other members present.

Award Recommended:—*Award of Merit.*

To Dahlia 'Herbert Brown' as an exhibition variety (votes 6 for, 0 against), from Messrs. Brown & Such, Ltd., Royal Berkshire Nurseries, Maidenhead. See p. 367.

Selected for trial at Wisley.

'Cherie,' 'Dorothy Tattam,' 'Mary Tattam,' 'Moonbeam,' from Mr. A. T. Barnes, 13 Cardington Road, Bedford.

'Barry Cotter,' 'Firefloat,' 'Herbert Brown,' 'Joyful,' 'Modette,' from Messrs. Brown & Such, Ltd., Maidenhead.

'Craigpark Gem,' from Messrs. Carter Page & Co., 52 London Wall, E.C. 2.

SEPTEMBER 27, 1945.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. C. H. CURTIS, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:—*Award of Merit.*

To 'Joan Fellowes,' as an exhibition variety (votes 12 for, 0 against), shown by Mr. H. Woolman, Sandy Hill Nurseries, Shirley, Birmingham. See p. 367.

To 'Freda Pearce,' as an exhibition variety (votes 11 for, 2 against), shown by Mr. H. Shoesmith, Mayford, Woking, Surrey. See p. 366.

'Millersdale,' 'Day Dream' and 'Sparkler,' as exhibition varieties (votes 12 for, 0 against in each case), all shown by Messrs. J. & T. Johnson, Tibshelf, Derbys. See pp. 366, 367.

Selected for trial at Wisley.

'Rose Bouquet,' 'Lilliput Linnet,' 'Joan Fellowes' and 'Lapworth,' all shown by Mr. H. Woolman, Shirley, Birmingham.

'Victoria,' 'Freda Pearce,' 'Shell Bouquet' and 'Cream Bouquet,' all shown by Mr. H. Shoesmith, Mayford, Woking.

'Bubbles,' 'Millersdale,' 'Day Dream,' 'Sparkler,' 'Moonstone' and 'Bo-Peep,' all shown by Messrs. J. & T. Johnson, Tibshelf, Derbys.

Other Exhibits.

'Missouri,' 'Victory Salute' and 'Evening Glow,' all shown by Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbysh.

'Pink Bouquet,' shown by Mr. H. Woolman, Shirley, Birmingham.

'Trevor Adams,' and 'Edensor' (selected for trial, September 11, 1945), shown by Messrs. J. & T. Johnson, Tibshelf, Derbys.

OCTOBER 2, 1945.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

Fruiting of Quercus acuta.—Mr. W. V. Bishop sent shoots of the Japanese evergreen oak, *Quercus acuta*, with immature acorns grown in Jephson Gardens, Leamington Spa.

Twin Apples.—Several examples of twin Apples were sent, in each instance having separate cores but joined for almost the whole length of the fruits and having a continuous skin over the whole, the receptacles only of the two flowers and the stalks having failed to separate. Such fasciated Apples are frequent.

Fasciated Amaryllis Belladonna.—Mr. Bowles showed an excellent example of fasciation in *Amaryllis Belladonna* from Major Pam's garden at Wormleybury, Herts., two flowers having failed to separate and both having grown on a common stalk to full size.

Various Conifers.—Commander Gilliland of Brook House, Londonderry, sent pieces of *Picea purgens* vars. *glauca* and *Kosteriana*, *Juniperus pachyphloea* and *Cupressus arizonica* and its var. *conica*, remarking on the frequent occurrence of glaucous foliage in the inland species of Conifers as compared with those from the Californian seaboard. He also sent:

Arundinaria Simonii and *A. aristata*, illustrating both the young and the mature growths, the latter stout and hard in both species. The characteristic

lx PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

purplish leaf-sheaths of *A. Simonii* were well shown. *A. aristata* appears to grow well at Londonderry, but is not hardy in most parts of the British Isles. It received an Award of Merit in 1898 and a plant with 600 canes, many of them 26 feet long, is recorded from Co. Kerry, and some fine plants also in Cornwall, but the warmth and humid atmosphere of these districts seems necessary for its success.

FRUIT AND VEGETABLE COMMITTEE.—Mr. F. A. SECRETT, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended :—

Gold Medal.

To St. Andrews Hospital, Northampton, for group of Potatoes (16 for, 1 against).

To Messrs. Sutton & Sons, Reading, for group of vegetables (15 for, 0 against)

Silver-gilt Knightian Medal.

To Hornchurch Urban District Council (Parks Dept.), Hornchurch, Essex, for group of Vegetables.

To Ilford Borough Council, Ilford, Essex, for group of vegetables.

Silver Knightian Medal.

To Messrs. Dobbie & Co., Edinburgh, for group of Potatoes.

Silver-gilt Hogg Medal.

To W. Watkins, Esq., Newsells Gardens, Royston, Herts., for group of Fruit.

Silver Hogg Medal.

To Messrs. Cheal & Sons, Crawley, Sussex, for group of fruit.

To Nigel Hanbury, Esq., Green End House, nr. Ware, Herts., for group of fruit.

Other Exhibits.

Group of Apples from The Director, East Malling Research Station, East Malling, Kent.

Group of Pears from The National Fruit Trials, Wisley.

Apple 'John Clements,' from G. J. Clements, Esq., 2 South Riding, Bricket Wood, nr. St. Albans.

Apple 'Kidlington Orange,' from R. M. Rhodes, Esq., 61 Oxford Road, Kidlington, Oxford.

Apple 'Marjory Slater,' from T. R. Slater, Esq., 17 Chapel Place, Maidstone.

Apples 'Oxford Beauty,' 'Oxford Friend,' 'Oxford Pippin' and 'Sergeant Peggy,' from J. F. Wastie, Esq., Eynsham, Oxford.

Seedling Apple, from C. W. Hannan, Esq., 27 Dudley Road, Walton-on-Thames.

Seedling Apple, from T. E. Bannister, Esq., Gravel Pit Nurseries, Sundridge, nr. Sevenoaks.

Seedling Peach, from Miss A. D. Champness, 20 Preston Road, Wembley Park.

ORCHID COMMITTEE.—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

First-class Certificate.

To *Renanthera Storiei* var. 'St. Albans' (votes 7 for, 1 against), from Messrs. Sanders, St. Albans.

Award of Merit.

To *Laeliocattleya* × 'Bronsia' (votes 8 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.



Photo, N. K. Gould]

FIG. 100 — IRIS 'WHITE CHRY'
(See p. 351.)



Photo, N. K. Gould

FIG. 107 —IRIS 'AMIGO.'
(See p. 352.)



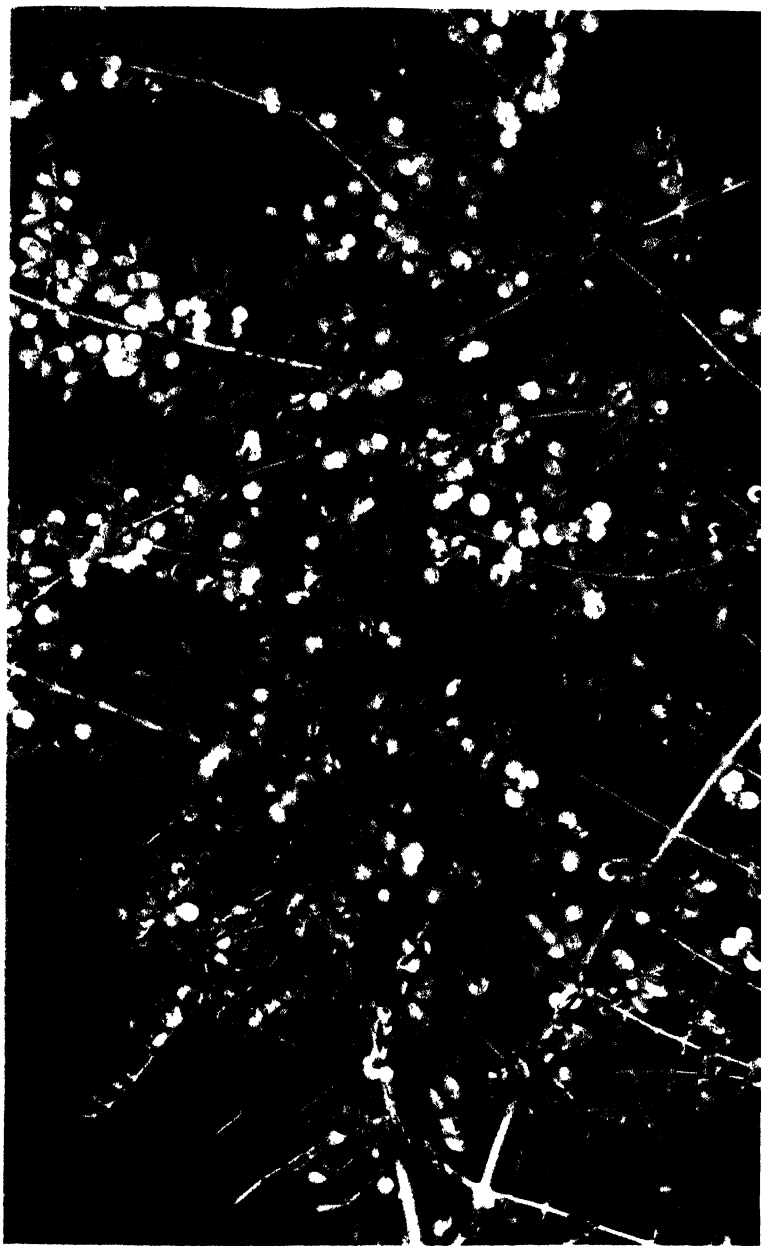
Photo N. K. Gould

FIG. 108 —IRIS 'NINA LEVETT'
(See p. 352)



Photo, N. K. Gould

FIG. 100. IRIS 'ROSY WINGS'
(See p. 332.)



Photo, Malby }

FIG. 110.--*COPROSMA PARVIFOLIA*.
(See p. 367.)



Photo, N K Gould]

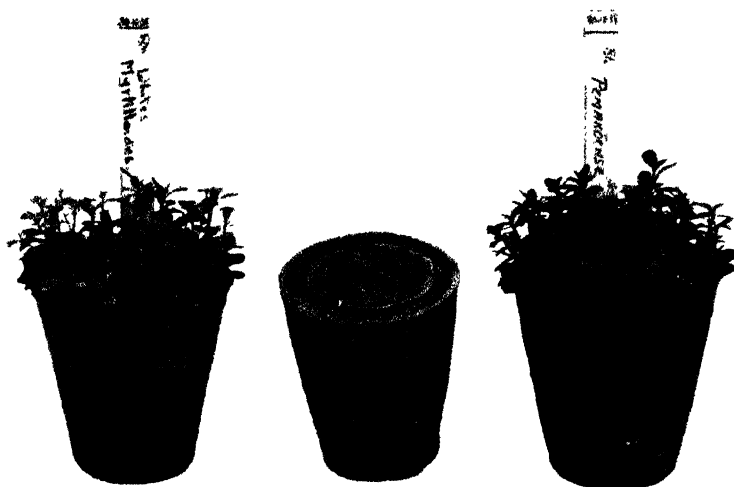
FIG 111 —RHODODENDRON LAYER LIFTED FROM PARENT PLANT, TWO YEARS AFTER LAYERING.

(See p 362.)



Photo T. Hango

FIG. 112.—SOFT-WOOD CUTTING OF LARGE-LEAVED RHODODENDRON ROOTED IN JULY
(See p. 350.)



Photo, N. K. Gould

FIG. 113.—ROOTED CUTTINGS OF SMALL-LEAVED RHODODENDRONS—INSERTED NOVEMBER
AROUND SIDES OF POTS

Centre—Pot ready for insertion of cuttings—Photographed in May.

(See p. 360.)



Photo. V. K. Gould.

FIG. 114 - RHODODENDRON, PLANT COMPLETELY LAYERED TO PROVIDE THE MAXIMUM NUMBER OF NEW PLANTS.

(See p. 361.)

INDEX.

References in Clarendon type are to figures and illustrations.

Part	1.	Pages	1-36
"	2.	"	37-56
"	3.	"	57-92
"	4.	"	93-120
"	5.	"	121-152
"	6.	"	153-184

- Aberconway, Lord, Embothrium coccineum, 191
 Magnolia Sargentiana and M.S. var. Robusta, 159
 Alstroemeria violacea, **A.M.**, xlix
 Amsler, Dr. M., Effect of Artificial Frost on Seed Germination, 316
 Anchusa caespitosa, **A.M.**, 245, xxxix
 Anemone obtusiloba patula, **90**, 288
 umbellata, **74**, 325
 Anley, G., The Iris, 248
 Apple, Arthur Turner, **A.G.M.**, 244
 Bess Poole ? by A. Simmonds, 9
 Bramley's Seedling, Origin of, by A. Simmonds, 99
 Bramley's Seedling, **37**, 102
 Ellison's Orange, Origin of, by A. Simmonds, 151
 Arctostaphylos Manzanita, by A. T. Johnson, 52
 Armitage, E., Note on Albino Flowers, 146
 Additional note on Albino Flowers, 362
 Ashton, E. R., Specimen Orchids, 208
 Aster acris, **A.G.M.**, 244
 Auricula, by K. C. Corsar, 192
 Auricula Bartley, **62**, 196
 Joy, **63**, 196
 Katharine, **64**, 196

- Backhouse, Mrs. R. O., **26**, 75
 Baptisia australis, **A.G.M.**, 270
 Begonia Ballet Girl, **A.M.**, 305, xlviii
 Salmonea, **A.M.**, 305, xlvii
 Scarlet Flambeau, **A.M.**, 305, xlviii

Book Reviews :

- British Botanists, by J. Gilmour, 120
 British Trees in Winter, by F. K. Makins, 248
 Catalogue of Vascular Plants of S. Tome, by A. W. Exell, 120
 Cauliflowers, Ministry of Agriculture and Fisheries Bulletin, No. 131, 368
 Diagnosis of Mineral Deficiencies in Plants, Supplement 1944, by T. Wallace, 152
 Diseases of Vegetables, by Lawrence Ogilvie, 248
 Flora of Uig, Ed. by M. S. Campbell, 248
 Flowers in Britain, by L. J. F. Brimble
 Fragmenta Papuana, by H. J. Lam, 308
 Fruit Growing : Modern Cultural Methods, by N. B. Bagenal, 308
 Gardener's Earth, by S. B. Whitehead, 120

Part	7.	Pages	185-216
"	8.	"	217-248
"	9.	"	249-276
"	10.	"	277-308
"	11.	"	309-340
"	12.	"	341-368

Book Reviews:

- Genus Oxalis in South Africa, by T. M. Salter, 152
 John Merle Coulter, by A. D. Rogers, 36
 Miniature Alpine Gardening, by Lawrence D. Hills, 308
 Plant Injection for Diagnostic and Curative Purposes, Further work on, by W. A. Roach and W. O. Roberts, 368
 Plants and Plant Science in Latin America, by Frans Verdoorn, 368
 Ploughman's Folly, by E. H. Faulkner, 248
 Rhubarb, by Ministry of Agriculture and Fisheries, 56
 Root Disease Fungi, by S. D. Garrett, 308
 Soil Sense for Green Gardeners, by G. E. Whitehead, 368
 Threshing of Grass Root and Vegetable Seed Crops by Ministry of Agriculture and Fisheries, 308
 Tomato and Cucumber Culture, by A. A. Richards, 152
 Trees and Shrubs throughout the Year, by Blanche Henrey, 152
 Trees and Toadstools, by Dr. M. C. Rayner, 308
 Brassia verrucosa, **65**, 208
 Brassolaeliocattleya x Crusader var. Templar, **A.M.**, 53, xvi
 Brown, F. C., Dwarf and Bush Tomatoes, 81
 Bush and Soft Fruits for the Private Garden, by T. E. Tomalin, 29
 Cahen, E., Duke's Tea Tree, 79
 Calanthe nipponica, **A.M.**, 245, xxxvii
 Camellias, by F. J. Chittenden, 210
 Campanula laciniata, **A.M.**, 275, liiii
 Campbell, W. M., and Sir G. Evans, Potato Eyes for Seed, 142
 Carnation Constance Pullen, **A.M.**, 339, liii
 Cottage Apricot, **H.C.**, 119
 Cottage Pink, **C.**, 119
 Cottage Wonder, **C.**, 119
 E. M. Wilkinson, **A.M.**, 305, 1
 Evelyn Knapp, **A.M.**, 305, 1
 Kathleen Stevens, **A.M.**, 214, xxxv
 Peter Lord, **A.M.**, 183, xxix
 Rose Frills, **A.M.**, 305, 1
 Sterling, **A.M.**, 183, xxix
 Carrot Fly and its Control in Gardens, by G. Fox Wilson, 84
 Cattleya x Stalin var. Victory, **A.M.**, 339, liii
 Celmisia bellidioides, **89**, 286
 Chittenden, F. J., Camellias, 210

Chlorosis of Tomatoes, by T. Walsh and E. J. Clarke, 202

Chrysanthemum Angela, A.M., 53, xvi

Arnhem, A.M., 366, lvii

August Glory, A.M., 366, lvii

August Pink, A.M., 33

August Red, A.M., 340, liv

Cinnamon, A.M., 33

Cressington, 96, 296

Day Dream, A.M., 366, lix

Diane, A.M., 366, lvii

Egerton, A.M., 340, liv

Empire White, A.M., 32

Fair Maid, A.M., 340, liv

Fire Drake, A.M., 366, lvii

Freda Pierce, A.M., 366, lix

Gladiator, F.C.C., 34

Golden Gem, F.C.C., 32

Hyde, A.M., 367, lvii

Joan Fellowes, A.M., 367, lix

Lilliput Honeybird, 9

Lilliput Redbreast, A.M., 53, xvi

Millersdale, A.M., 367, lix

Radar, A.M., 367, lvii

Red Sweetheart, A.M., 340, liv

Ronald, A.M., 53, xvi

Ruby, F.C.C., 34

Sparkler, A.M., 367, lix

Sweetheart, A.M., 33

Sweetness, A.M., 33

Treasure, A.M., 367, lvii

Yellow Bouquet, A.M., 32

Chrysanthemums, by J. Woolman, 296

Clarke, E. J., and T. Walsh, Chlorosis of Tomatoes, 202

Codonopsis mollis, 91, 288

Comber, H. F., Liliun cathayanum, 78

Coprosma parviflora, A.M., 367, lvii

Coreopsis verticillata, A.G.M., 363

Corsar, K. C., Auricula, 192

Cotoneaster horizontalis, Insect Pests of, by G. Fox Wilson, 271

Cotyledon oppositifolia, 365

Craig, Wm. N., Lily Notes from New England, 241

Curtis, William, Bi-centenary of, by Bishop of Truro, 353

Cymbidium × Jean Brummitt, A.M., 151, xxvi

× Sunrise, var. F. K. Sander, A.M., 184, xxxi

Cypripedium × Alison Jensen, A.M., 183, xxix

× Battle of Egypt var. Alpha, A.M., 151, xxv

× Cradillon var. Miona, A.M., 151, xxvi

× Denehurst, A.M., 183, xxix

× John Pitts, A.M., 184, xxix

× Judith Dance, A.M., 151, xxv

× Milkmaid, F.C.C., 53, xvi

niveum var. Goliath, F.C.C., 305, xlix

parviflorum, A.M., 245, xxxviii

× Silver Wings, A.M., 151, xxv

× Vista var. Excelsior, A.M., 151, xxv

Dahlia Battle, A.M., 35

Betty Holmes, A.M., 367, lviii

Dahlia Boldness, H.C., 35

Charlotte Collins, A.M., 367, lviii

Enoch Potts, H.C., 34

Ethel Cottrell, H.C., 34

Goldfield, H.C., 34

Herbert Brown, A.M., 367, lix

Kennet, H.C., 36

Lady Alice, 58

Leo, H.C., 35

Lord Lambourne, 54

Marian Tate, A.M., 367, lviii

Rubetone, H.C., 34

Towneley Fairy, H.C., 34

Trent, A.M., 36

Warden Oom, A.M., 35

Dahlias, by H. Stredwick, 160

Correction, 243

Davis, J. C. P. M., Sweet Peas, 128

Dawson, R. B., Lawns and their Reconstruction, 165

Delphinium Blackmore's Blue, A.M., 306, xlv

Blue Lagoon, A.M., 275, xlv

Minerva, A.M., 306, xlv

Princess Alexandra, A.M., 306, xlv

Pyramus, A.M., 306, xlv

Delphiniums, by H. S. Hotblack, 42

Dendrobium Adrasta, A.M., 245, xl

thyrsiflorum, 87, 208

Dendrochilum glumaceum, 66, 208

Deutzia setchuenensis var. corymbiflora, A.M., 306, xlix

Didissandra grandis, 78, 238

Difficult Plants for the Enterprising Amateur, by D. Wilkie, 284

Doritis pulcherrima var. Verulam, A.M., 368, lvii

Dried Potato Eyes, Experiments with, by J. Raine, 315

Duke's Tea Tree, by E. Cahen, 81

Dwarf and Bush Tomatoes, by F. C. Brown, 81

Embothrium coccineum, by Lord Aberconway, 191

by Comd. F. Gilliland, 256

by Dr. W. Fox, 289, 364

by W. Balfour Gourlay, 317

Eriogynum ovalifolium, 88, 285

Eucryphia glutinosa, 72, 238

Evans, Sir Geoffrey and W. M. Campbell, Experiments in the use of Potato eyes for Seed, 142

Exhibition Vegetables, Size of, by W. F. Giles, 7

Ex-service Men and Women, Training of, 215

Flora of Greece, by M. Ogilvie-Grant, 298

Four Friends of a Hundred Years, by Bishop of Truro, 238

Fox, Dr. W., Embothrium coccineum, 289, 364

Garden Plants, Naming of, 179

Garnett, C. S., Orchids in Equatorial Brazil, 48

Gentiana amoena var. major, 82, 288

Orva, A.M., 368, lviii

- Giles, W. F., Size of Exhibition Vegetables, 7
 Sweet or Sugar Corn, 54
 Gilliland, Cmdr. F., Embotrium coccineum, 256
 Gourlay, W. Balfour, Embotrium coccineum, 137
 Green, D. E., A Suspected Disease of Shallots and Onions, 24
 and C. T. Thomas, Blight of Outdoor Tomatoes, 211
 Green Gage, Origin of the Name, by A. Simmonds, 240
 Giuseppe, Dr. P. L., Some Rare Rock Plants, 235
 Gypsophila paniculata Rosy Veil, **A.G.M.**, 363
- Hanger, F., Cultivation of Rhododendrons, 355
 Plants for the Winter Garden, 21
 Hesperoyucca Whipplei, **A.M.**, 340, liii
 Higgins, Vera, and Major Pam, Exotic Garden of Monaco, 175
 Hotblack, H. S., Delphiniums, 42
- Ingram, C., Japanese Cherries, 72
 Notes on Japanese Cherries, 10
 Iris, bearded, Amigo, **A.M.**, 365
 Iris, The, by G. Anley, 348
 Irises for the Little Garden, by Miss L. F. Pesel, 257
- Japanese Cherries, by C. Ingram, 72
 Notes on, Pt. III, by C. Ingram, 10
 Johnson, A. T., Arctostaphylos Manzanita, 52
 Meconopsis chelidoniifolia, 103
 Rose Hybrids, 331
- Knight, F. P., Vegetative Propagation of Flowering Trees and Shrubs, 319
- Laeliocattleya × Babylon, Westonbirt var., **A.M.**, 306, xlix
 × Detta, **A.M.**, 53, xvi
 × Resolute var. Rapture, **F.C.C.**, 214, xxxv
- Leiophyllum buxifolium var. prostratum, **A.M.**, 245, xxxviii
- Lanarth, The Making of, by Bishop of Truro, 63, 104, 132
- Lawns and their Reconstruction, by R. B. Dawson, 165
- Leopard Moth, by G. Fox Wilson, 40, 50, 148
- Leucospermum mixtum, 88, 89, 110
 Lilium aurelianense, **A.M.**, 306, xlix
 Burnham Orange, **A.M.**, 275, xliii
 cathayanum, 27, 28, by H. F. Comber, 78
 Coronation, **A.M.**, 306, xlix
 Phyllis Cox, **A.M.**, 307, xlii
 Lilies, by R. W. Wallace, 291
 Lily Notes from New England, by Wm. N. Craig, 241
- Magnolia Dawsoniana, 88, 110
 Delavayi, 22, 70
 hypoleuca, 21, 71
- Magnolia Sargentiana and M.S. var. Robusta, by Lord Aberconway, 159
 Malus Simcoe, **A.M.**, 340, liii
 Meconopsis chelidoniifolia, by A. T. Johnson, 103
 Melons, Cultivation of, by I. W. Read, 338
 Monaco, Exotic Garden of, by Major A. Pam and Vera Higgins, 175
 Mules, Dr., 25, 74
 Myrtus Lechleriana, **A.M.**, 245, xxxiv
- Narcissus Alamein, **A.M.**, 214, xxxii
 Armada, **A.M.**, 214, xxxii
 Decency, **F.C.C.**, 90
 Feu de Joie, **A.M.**, 92
 Foresight, **A.M.**, 215, xxxii
 Golden Perfection, **A.M.**, 92
 Jubilant, **F.C.C.**, 90
 Krakatoa, **A.M.**, 215, xxxii
 Moira, **A.M.**, 215, xxxv
 Mrs. E. H. Krelage, **A.M.**, 90
 Mrs. William Copeland, **A.M.**, 92
 Prince, **A.M.**, 91
 Sarchedon, **A.M.**, 92
 Sea Shell, **A.M.**, 91
 Trouseau, **A.M.**, 245, xxxii
- Norris, Major R. H., Trees and Plants in Palestine, 197
 Note on Albino Flowers, by E. Armistage, 146
 Note on Albino Flowers, Additional, 362
 Nymphaea Sunrise, **A.M.**, 307, xlix
- Odontioda × Zeta var. Nobility, **A.M.**, 246, xl
 Odontoglossum × Asca, var. Argus, **A.M.**, 307, l
 × Goldbeam var. Luna, **F.C.C.**, 151, xxvi
 Williamsianum, 69, 208
- Ogilvie-Grant, M., Flora of Greece, 298
 Omphalogramma Farreri, 93, 94, 288
- Onion Sets, Production of, by M. A. H. Tincker, F. C. Brown, O. V. S. Heath and M. Holdsworth, 135
- Orchids in Equatorial Brazil, by C. S. Garnett, 48
- Orchids, Specimen, by E. R. Ashton, 208
- Palestine, Trees and Plants in, Major F. H. Norris, 197
- Palmer, Lewis, A Giant Stock, 234
- Pam, Major A., and Vera Higgins, Exotic Gardens of Monaco, 175
- Pernettya prostrata var. angustata, **A.M.**, 9
- Pesel, Miss L. F., Irises for the Little Garden, 257
- Phaius Marthiae, 68, 208
- Plants for the Winter Garden, by F. Hanger, 21
- Potato Eyes for Seed, Experiments in the use of, by W. M. Campbell and Sir G. Evans, 142
- Primula Allionii Apple Blossom, **A.M.**, 215, xxxi
 aureata, 95, 289
 cortusoides, **A.G.M.**, 244

- Primula marginata* Hyacinthia, **A.M.**, 215, xxi
 Propagation, Degeneration and Vigour of Growth, by M. A. H. Tincker, 333
Prunus serrulata Pink Perfection, **A.M.**, 246, xxv
- Raine, J., Experiments with Dried Potato Eyes, 315
 Read, I. W., Cultivation of Melons, 338
Rhazya orientalis, **A.M.**, 307, xlv
Rhododendron Albatross, **A.M.**, 276, xlv
 Alison, Johnstone, **A.M.**, 246, xxxvi
amoenum, 73, 238
Aspansia, **A.M.**, 246, xxxvi
Bric-a-Brac, **A.M.**, 48, 184, xxx
Carita, **A.M.**, 246, xxxvi
Cilipnense, 3, 23
cinnabarinum var. *Blandfordiflorum*, **A.M.**, 276, xlv
Dot, **A.M.**, 246, xxxvi
Geraldi, **A.M.**, 184, xxxii
Golden Horn, **A.M.**, 246, xxxviii
Grosclaude, **A.M.**, 276, xlv
Hinomayo, **F.C.C.**, 365
Idealist, **A.M.**, 246, xxxviii
Impy, **A.M.**, 307, xlvii
Ivanhoe, **A.M.**, 247, xl
leucaspis, 2, 23
Matador, **A.M.**, 247, xxxvi
Mohamet, **A.M.**, 276, xlv
Mosaicque, **A.M.**, xlv, 276
Netty Koster, **A.M.**, 366
Orange Beauty, **A.M.**, 366
Red Cap, var. *Townhill Park*, **A.M.**, 307, xlvii
saluenense, **A.M.**, 247, xxxvi
siderophyllum, **A.M.**, 184, xxxii
species, **A.M.**, 246, xxxviii
Springtime, **A.M.**, 184, xxxii
White Beauty, **A.M.**, 247, xxxvi
- Rhododendrons*, Cultivation of, by F. Hanger, 355
Rhododendrons, New Types of Hybrid, by J. P. C. Russell, 225
Rhodohypoxis Baurii major, **A.M.**, 276, xliii
Richardia Rehmanni, **A.M.**, 247, xxxix
Rimaria Heathii, 71, 239
 Rock Plants, Some Rare, by Dr. P. L. Guiseppi, 235
Rosa filipes var. *semi-plena*, **A.M.**, 307, xlv
 Rose Hybrids, by A. T. Johnson, 331
 Roses after the War, by G. M. Taylor, 261
 Ross, Charles, 23, 77
 Russell, J. P. C., New Types of Hybrid *Rhododendrons*, 225
- Saxifraga cebennensis*, **A.M.**, 247, xxxix
 Seed Germination, Effect of Artificial Frost on, by Dr. M. Amsler, 316
- Shallots and Onions, A suspected Virus disease of, by D. E. Green, 24
 Simmonds, A., Apple Bess Poole ?, 9
 Apple, Bramley's Seedling, Origin of, 99
 Apple, Ellison's Orange, Origin of, 150
 Green Gage, Origin of the name, 240
 Who was Who ? 73
- Sinkins, Mrs., 24, 73
 Solidago, 31
 'Leneralis', 8, 31
 Stock, A Giant, by Lewis Palmer, 234
 Stredwick, H., Dahlias, 160
Styrax japonicus var. *Fargesii*, **A.M.**, 340, xliii
 Sweet Corn in England, by C. D. R. Dawson, 111
 Sweet or Sugar Corn, by W. F. Giles, 54
 Sweet Pea, Mrs. C. Kay, 43, 131
 Sweet Peas, by J. C. P. M. Davis, 128
- Taylor, G. M., Roses after the War, 261
Thalictrum psilotifolium, 76, 236
 Thomas, C. T., and D. E. Green, Blight of Outdoor Tomatoes, 211
Thymus membranaceus, 76, 237
 Tincker, M. A. H., Production of Onion Sets, 135
 Propagation, Degeneration and Vigour of Growth, 333
 Tomatoes, Blight of Outdoor, by D. E. Green and C. T. Thomas, 211
 Tomalin, T. E., Bush and Soft Fruits for the Private Garden, 29
 Trials at Wisley, Rules Governing, 177
 Truro, Bishop of, Four Friends of a Hundred Years, 238
 The Making of Lanarth, 63, 104, 132
 Who was John Hollybush ? 20
Tulipa celsiana, 51
Typha minima, **A.M.**, 276, xliii
- Vanda coerulescens* var. *Bluebird*, **A.M.**, 184, xxxi
 Vegetative Propagation of Flowering Trees and Shrubs, by F. P. Knight, 319
Vuylstekeara × *Adria*, **A.M.**, 247, xxxvii
- Walsh, Thomas and E. J. Clarke, Chlorosis of Tomatoes, 202
 Wallace, R. W., Lilies, 291
Weldenia candida, 77, 237
 Who was John Hollybush ? 'By Bishop of Truro, 20
 Who was Who ? By A. Simmonds, 73
 Wilkie, D., Difficult Plants for the Enterprising Amateur, 284
 Insect Pests of *Cotoneaster horizontalis*, 271
 Leopard Moth, 148
Wilsonaria × *Coriola*, **A.M.**, 247, xxxvii
Wistaria venusta, **A.M.**, 247, xxvii
 Woolman, J., Chrysanthemums, 296

THE CULTIVATION OF RHODODENDRONS.

By FRANCIS HANGER.

THE Editor of this JOURNAL has asked me to write a short article on Rhododendron culture. This is a very exhaustive subject, and much could be written concerning it from an expert point of view. I will, however, endeavour in this short note to give a brief outline of the outstanding elementary points necessary for the prosperity of this wonderful genus of plants, hoping it will help and encourage the more amateur Rhododendron enthusiasts to grow and multiply their pets and treasures.

First of all we must realize the great difference between the various families which make up this genus. Species like *R. sino-grande* have very large leaves ; when well grown they are up to 30 inches in length and half as wide. Others have leaves of various smaller sizes until we come to the alpine forms with small almost Thyme-like foliage. The difference of habit and growth is also fantastic. *R. giganteum* attains 80 feet in height in its natural home while *R. keleticum* and *R. patulum* are no more than a few inches high. Some are tender and others quite hardy ; some need and demand good shelter, others will grow in more exposed conditions.

The best guide to these problems is to study nature's planting. In the shelter and shade of the Himalayas are found the species with large tropical-looking leaves, and as we climb to higher altitudes towards the summit of the mountains so do the Rhododendrons become dwarfer in habit and the leaves smaller until we come to the snow-bound heights and find the hardier dwarf alpine varieties. Therefore, the larger the leaf of the plant, the less wind resistant it is, requiring ample shelter, shade and water to maintain it in perfect health, while the smaller the leaf (in practically all cases), the more open can be its position and the less water will be needed for its welfare.

We know that many of the Lapponicum species were originally found growing in bogs in their natural home and some among limestone cliffs, yet we must not be misguided by this, for in this English climate good drainage and lime-free soil is of the utmost importance for the successful cultivation of all Rhododendrons.

Some of the genus are epiphytic, and in their wild state are hosts of other plants, finding sustenance in the lichen, etc., which accumulates on the branches and trunks of large trees and shrubs. If this type of Rhododendron is to be grown really successfully it needs a very open and light soil with abundant drainage.

Here at Exbury for the past three years we have averaged only 26 inches of rain per season, and unless one has the advantage of a garden in a much rainier district, a good water supply is essential to enable the grower to water the plants when dry ; especially does this apply in the growing season. During the war I have found it difficult or impossible to give the plants as much water as was really necessary owing to shortage of labour, but much of the difficulty has been overcome by paying strict attention to those plants about to break into new growth.

A very good plan is to water well all Rhododendrons as soon as they have been relieved of their spent blooms. This extra supply of water encourages the plants to push their growth buds rapidly, and it

is during this season of growth that the plant needs the extra nourishment after exhaustion from probable profuse blooming. Rhododendrons being lovers of moisture speedily tell you when they are thirsty and just as readily say thank you after a soaking by picking up and expanding their leaves once more. Much moisture-content can be retained by mulching with any decayed leaves available. All fallen leaves from woodland paths should be swept around the base of the plants for Rhododendrons, being surface rooted, simply love it. Continued top-dressing of leaves and green bracken fronds does much towards checking growth of weeds. If bracken is used, care should be exercised not to overdo the application for, when the bracken becomes dry, it absorbs the moisture from light showers and prevents the surface roots of the plants from benefiting.

All Rhododendrons appreciate the speedy removal of their faded flowers. This is not always possible, but every endeavour should be made to remove all spent blooms from *R. Griffithsianum* and its hybrids, and the same applies to *R. discolor*, *R. Thomsonii*, *R. Fortunei*, *R. campylocarpum* and similar species and their offspring.

Sometimes Rhododendrons become sickly-looking due perhaps to over-flowering. Much vigour can be restored to the shrub by drastically thinning the flower-buds, and in some cases complete dismantling is a necessity. Care is needed to remove the flower-bud only, and not to damage the growth buds immediately below. This operation should be carried out just before the bud becomes sticky and not during frosty weather.

A woodland free from heavy shade and surface-rooting trees such as Beech and Lime is preferable for Rhododendrons. The deep-rooted Oaks with their lighter shade are excellent, while tall, thin Pine has the advantage of giving that canopy so useful for preventing the slight early spring frosts from spoiling the blossoms. Birch, especially the Silver Birch, look handsome with Rhododendrons, and if the wild *R. ponticum* grows in the wood, excellent shelter and cover is afforded against ground draughts.

When clearing a wood in readiness for planting, great care is needed (after the clearing of the brushwood) in selecting the trees to be sacrificed. First, all dead or dying trees should be removed, if possible with roots. Then continue to select the poorer specimens, finally leaving sufficient trees only for the semi-shading of the plants with enough room between the trees to enable beds to be trenched (this is preferable to large holes), leaving 10 feet to 15 feet of ground between the edge of the bed and the foot of the nearest large tree.

The trunks of the trees must be clear of branches some way up to enable the Rhododendrons to develop their growth naturally. Should the shade be too dense the wood of the plants cannot ripen enough to form flower-buds and the whole shrub becomes spindly and loses its true habit. A belt or groups of Conifers will be necessary to surround some open woods where there is a lack of ground shelter.

Rhododendrons being fibrous rooting are amongst the easiest of plants to transplant, and, given the best of attention as to watering, this can be carried out at almost any season. Of course, the best time is during open weather from October until March. I prefer the early winter months as the winter rains which follow on enable the plants to get more or less established before the hot weather.

The planter will need to know his Rhododendrons well and give the permanent individual plants enough room to develop, and, for

temporary filling of the ground, young seedlings can be placed between them, taking care that the latter are not allowed to remain and crowd out the former.

Should the first selected bed not suit a particular species, do not be afraid to take it for a ride to another portion of your woodland and give it a new home. Seedling plants growing very freely, perhaps too freely, are often checked in growth and thus forced into flower by being dug up and transplanted in another place. This is a wonderful advantage where hundreds of *Rhododendron* seedlings are raised, as the grower can then classify his hybrids, burn the rubbish and give extra attention to the choicest varieties. When lifting *Rhododendrons* for transplanting, always aim to get that shallow ball to your plant, lift with forks and do not chop round it with a spade as is often done in nurseries, or you will have that bucket shape ball so uncharacteristic of this shallow-rooting genus. Be sure and plant your *Rhododendrons* in shallow saucer-shaped holes; more *Rhododendrons* are killed or spoiled by too deep planting than by any other cause. Although shallow planting is advocated, the plant should be made quite firm by treading, therefore it is most essential to have your soil in good working order at planting time.

Seed raising.—There are four main ways to increase *Rhododendrons* :—

1. Nature's way, *i.e.* by seed.
2. By root grafting or other forms of grafting.
3. By cuttings.
4. By layers.

Seed is nature's most common method of increase and often gives the readiest and least expensive means of reproduction, but hybrid *Rhododendrons* cannot be relied on to perpetuate themselves true to type. Species are different and if care is taken when pollinating them, they will be more or less constant in their offspring.

During late November onwards is the time to watch the seed-pods on their bushes very carefully and at the first sign of the capsules opening, they should be gathered, the packet labelled, and stored in a dry place. Any special hybrid that has been made during the season will need almost daily watching, especially after frosts or the whole seed may be lost by the pods splitting and scattering the seed on the ground when another year will have to go by before the cross can be made again.

Early in the New Year the seed can be cleaned ready for planting. It is very important to clean the seed well as any waste sown with the seed on the surface of the pans tends to encourage a fungus which speedily causes trouble amongst the tiny seedlings.

I have found that the middle of January is the best time to sow the seed of *Rhododendrons* provided a propagating frame with bottom heat is obtainable, and a temperature of 55°–60° F. can be maintained. This early start enables the plant to have a good long season in front of it and by the autumn lovely strong plants are ready to be either set out in the sheltered nursery, or better still, placed in rows in frames. Here there is no fear of frosts spoiling the young growth of the seedlings during the early autumn.

Except where large quantities are required, *Rhododendron* seed is best sown in pans of peat moss litter or "Sorbex." The pans should be perfectly clean and quite half filled with washed crocks. Pass the

peat moss or "Sorbex" through a quarter-inch sieve and it is then ready to place in the pans. Being of a spongy nature, a little patience is necessary to press the material evenly in the receptacles. Do not try to do this in one operation but rather in layers, until the pan is filled to within a half inch of the top. Finish the surface off with a fine layer of the same compost passed through a much finer sieve and press firmly. This gives a very even surface on which to sow the seed. To prepare these seed vessels perfectly one must have the compost in the correct state as regards moisture. Usually it is necessary to add water, which, of course, must be rain water, and well mix the peat moss litter by constant rubbing between the hands. When the pans are prepared they should have a really good watering, again with rain water, and allowed to stand all night, ready to be sown on the following morning. The seed must be evenly sown on the surface, taking care not to be too heavy handed and to sow reasonably thinly. Do not cover the seed other than with a sugaring of silver sand; place the pan in the propagating case with bottom heat; do not allow the surface of the compost to become dry, and within fourteen days germination will be well advanced. With seed, especially that sown without being covered, one must guard against fluctuations between dryness and saturation. A uniform moisture is essential, for the tiny growth from the seed can get scorched through lack of water almost before one has noticed they are on the move. This is even more important with the alpine varieties of *Rhododendron*; here the seed is so small and the ultimate growths so thread-like in appearance that a magnifying glass is necessary to see the first signs of germination. As soon as the cotyledons appear an anchoring of the seed will be necessary. This is easily accomplished with a fine layer of dry silver sand when the seedlings are dry, taking care not to bury the cotyledons of the seedlings. From now onwards air can be given to the propagation frame and gradually increased as the seedlings grow until they are strong enough to be placed on the bench in the house, which should be approximately a month after sowing. Care must be taken to keep the sun's direct rays from shining on the plants. All watering, if at all possible, should be by placing the pans in vessels of rain water and allowing the moisture to creep through the bottom until the pan is thoroughly soaked. This is to be preferred to overhead watering from a fine-rosed can. I strongly advise giving the seedlings one overhead watering with permanganate of potash; this certainly will prevent damping off. There is one danger in using permanganate—it should never be used if the plants are already wet from overhead watering. Do not again use permanganate unless there is evidence of trouble. Permanganate of Potash is cheap and easily obtained from any good sundriesman, and half a pound would last a large garden a long while. First, make a stock solution of 1 oz. of the crystals to 1 pint of water. For use, take 3 fluid ozs. of stock solution to half a gallon of water. As soon as the seedlings can be handled, prick them into boxes of compost consisting of equal parts of peat moss litter, leaf-mould, silver sand and a neutral loam.

Good results can be obtained by sowing *Rhododendrons*, especially the *Azaleas*, into cold frames, keeping them closed until germination starts, but in this case the latter part of March is early enough to sow. At times, with abundance of seed to spare, I have been successful with the germination of seed in the woodland nursery, all going to prove how simple it is to germinate *Rhododendron* seed. However, the

raising of the seed in warm houses is so much quicker and by far the better way if the conveniences are available.

Propagation by grafting.—The grafting of Rhododendrons I do not like. I once read that all grafted plants were frauds, but as a last resource of perpetuation I suppose we must give way and admit that many, many plants have been saved for cultivation by these means. The nurseryman must in many cases graft the hybrid Rhododendrons on the *ponticum* stock. Good craftsmen, however, endeavour to obliterate the evil of *ponticum* suckers for ever by taking pains to graft as low down to the soil as possible ; thus leaving fewer eyes on the stock and also giving the scion a fair chance to get on its own roots. Others, with speed and numbers as their one aim, are not so painstaking and graft their plants so that too much of the stem of the *ponticum* stock is left above the soil, with a resulting glut of suckers for evermore. I will not, in this short article, waste time describing the means and the art of the well-known *ponticum* stock grafting of Rhododendrons, but rather take this opportunity of endeavouring to get more people accustomed to the root grafting of Rhododendrons, thereby achieving the necessary perpetuation of plants without the evil of *R. ponticum* suckers. This is a very old and easy way of grafting with every chance of the scion eventually sending out roots of its own and becoming more or less self supporting. A good supply of Rhododendron roots should be available. Care is necessary in this selection ; short portions of various thicknesses to suit various sized scions should be chosen with plenty of fibrous roots attached. Should you by chance be discarding poor seedling Rhododendrons at the time, a good supply of roots will be at hand. Failing this, mats of root should be dug from beneath large *R. ponticum* plants and a selection made at the time of grafting. Do not allow these roots to become dry ; if not used for a day or so, a covering of soil will keep them fresh. The actual grafting is quite a simple operation. Choose a scion and portion of root about the same thickness, make your union with whichever graft you prefer (I use the saddle graft), tie firmly with raffia, making sure that at least one pair (two for preference) of cambiums meet perfectly. Wax it if you wish, but it is not necessary, then pot as if you were dealing with an ordinary plant, making sure the union is under the soil when the potting is completed. The size of the pot used will be governed by the size of grafted plant, and when finished it should be placed in the propagation pit with a slight bottom heat. You will be agreeably surprised how many takes you get. I find that this type of root grafting is best carried out during February. By using the roots only as stocks one has the advantage of no after trouble with suckers.

Rhododendrons from cuttings.—Few people increase their Rhododendrons by cuttings, yet many of them root very easily. Success in cutting propagation is only obtained by a careful study of the plants and continuous experiments. A propagator must know his plants and have the happy knack of knowing just when a cutting is fit. The larger the wood of the Rhododendron the more difficult they are to strike from cuttings, due to the presence of a large pith area. The more pith area there is in the wood of a shrub, the softer must be the cutting when taken, and bottom heat will be essential to root it. On the other hand, the harder the wood of the cutting, the colder and longer will be the treatment necessary for success. Very soft cuttings from the large-leaved Rhododendrons should always be taken early in the morning before the sun is bright. All stock plants should be in the best of

health and not suffering from want of water. Pots or beds to receive the cuttings should be ready beforehand to enable the propagator to insert the cuttings with the least possible delay as the flagging of this very soft type of cutting is practically fatal to success. These soft-wooded cuttings demand a moist and uniform atmosphere, a porous soil and, in nearly every case, bottom heat. Short, new current year's growths should be removed with heels attached, and if the cuttings are correct, no removal of superfluous leaves will be necessary as the cuttings will be well balanced. A rooting medium of three parts good sharp sand and one part of fine peat moss is quite good. As Rhododendrons are such a varied family of plants it is useless to treat all alike or to think all will root at the same time of the year. I commence taking the cuttings of the large leaf varieties at the end of June, others during July, then September and October and carry on until I come to the very small leaf alpine varieties which are best left until November and December and, in some cases, January before insertion. With these last-mentioned plants, the alpine type, most are dead hardy and will stand an open position, preferably one on a sheltered north slope. Cuttings of these root very easily, but do not be afraid to take a little of the old wood, as the young soft cuttings are very apt to damp off. These root best without bottom heat under a closed frame, round the sides of pots on the greenhouse staging or beneath bell-glasses in sandy soil on a shaded north border. First take a 3½-inch pot, cover the bottom with small crocks sufficient to bring the edge of the thumb pot, when placed inside, level with the edge of the larger pot. Keep the small pot central, fill both with your rooting compost and three edges of a pot will be available if necessary to root your cuttings. The thin-leaved Lapponicum varieties may have as many as 50 to 60 per pot, using the inside rim of the two pots and also the outside of the smaller pot. With the rather larger-leaved varieties of *R. saluenense*, *R. calostrotum* and *R. russatum*, it is advisable to use only the inside of the two pots and so not overcrowd the cuttings. These having a little thicker wood, it is necessary to insert their cuttings a few weeks earlier than the Lapponicum series.

A rough table of times to take cuttings of the many various kinds of Rhododendron may be helpful. I shall not endeavour now to give anything like a complete list but just sufficient to serve as a guide to the propagator, who must remember, as previously stated, that the larger the leaf of the plant, the earlier and softer must be the cutting, which will require bottom heat for quick rooting results; the smaller the leaf, the harder must be the wood, the colder the treatment and the later in the season can be the insertion of the cuttings.

If an attempt is to be made on series 'Grande,' 'Falconeri' and 'Fortunei,' a brisk bottom heat will be necessary and the cuttings should be inserted about the middle of June.

R. Maddenii, *R. Thomsonii*, *R. barbatum* and their hybrids are best rooted in July with bottom heat.

The cinnabarinum and neriiflorum series, containing *RR. repens*, *catocosmum*, *chaetomallum*, *haematodes*, *floccigerum*, *sperabile*, *concatenans*, *Keysii* and many others, are best, in my opinion, taken in August and early September with bottom heat. The triflorum series, with *RR. Augustinii*, *yunnanense*, *hanceanum*, *exquisitum*, *oreotrophes*, *timetum*, *ambiguum*, *triflorum*, *lutescens*, etc., and all the small-flowering tall varieties, strike well in late September or early October with slight bottom heat.

The anthropogon, cephalanthum, campylogynum and saluenense series, embracing *RR. calostrotum, prostratum, saluenense, crebreflorum, tsarongense, anthropogon, myrtilloides, Sargentianum, sphaeranthum* and many more, root easily if taken in late October or during the month of November.

The last of the Rhododendrons to be rooted are the thin-leaved Lapponicum series including *RR. microleucum, chryseum, flavidum, impeditum, muliense, paludosum, scintillans, telmateium*, etc. These may be taken in December and given cold treatment with every hope of successful rooting.

I consider it quite possible to raise the larger Rhododendrons from bud cuttings. Before the war I had begun this method of increase with *Griffithsianum* hybrids with quite 50 per cent. takes. Plants so raised became saleable plants two seasons ago. *R. 'Pink Pearl,'* Slocock's *campylocarpum* hybrids and similar Rhododendrons also gave a good return. The experiment was not sufficiently tried to write with certainty on the subject, but treated as bud cuttings with leaf attached, as I did at the end of July in bottom heat, there are possibilities. Perhaps better results could be obtained if the buds were taken at other seasons. I had intended giving the method a good testing during the following March, but the shortage of staff as the result of the war prevented that being done.

I will not dwell longer on Rhododendrons from cuttings, only to add a word on Azaleas. These root easily from soft cuttings taken about the end of June or beginning of July, placed in the propagating frame with bottom heat. The difficulty does not arise at the early stage, trouble commences when you try to winter them. The buds drop and the cuttings fail to grow away. Of course, I am referring to the deciduous varieties. Kurume and such like evergreens, often spoken of as Azaleas, are so easy to root from cuttings that I need not take up your time with them. If the deciduous varieties are rooted when soft in July, the best plan is to keep them growing, if possible, all the winter and not let them rest. Fair results are obtained by striking them cold under bell-glasses in the autumn months. However, I find the layering of Azaleas is the best means of multiplication.

Rhododendrons from layers.—This last method is probably the best means of increase from an amateur grower's point of view and is undoubtedly the most successful for him or her to achieve. It can be accomplished more or less at any season of the year, providing there is no frost, and it is an exceedingly simple operation to perform. Any varieties of Rhododendrons with the very rough bark can be easily layered and will make plenty of roots and be ready for lifting and taking from the parent plants in eighteen months or two years.

Rhododendrons such as *R. Hookerii, R. barbatum, R. Thomsonii*, etc., have very smooth barks and do not root so readily. Incidentally, this type of Rhododendron must not be cut or pruned back as it will not break and grow away in the same free manner as those Rhododendrons with the *R. ponticum*-like wood.

Nurserymen requiring thousands of layers dig up large plants, take them to the layering ground, throw them on their sides and layer every possible tip. This can easily be done if one wishes, but usually the amateur, if he has a plant he wants to propagate and there are branches which more or less lend themselves to being pegged to the ground, is satisfied to get a few duplicates for himself and his friends. In this case select branches you wish to layer, remove the soil to form

a little narrow trench and, before replacing the soil, peg the branch in it sufficiently far from the tip to enable it to be turned and secured in an upright position. The abrupt bending of the elbow below the soil is of the utmost importance and upon it depends the difference between success and failure. This acute turn to form the elbow is the means of checking the flow of sap and thus creating for the branch the necessity of forming roots to obtain food for its existence. With branches laid down and not sufficiently turned, the sap from the parent continues to flow along to the tips unchecked, enabling the branch to grow as usual, with no need of new roots, resulting in slow rooting and in many cases failure.

We seldom twist or in any way bruise or cut our layers at the elbow, but peg it truly secure between the elbow and the parent plant, and again we push short bamboos into the ground past the elbow and close up to it, leaving a portion of the bamboo out of the ground to secure the layer in a perfectly upright position and the results are very good. To anchor the layers and also to form the elbow, large sand stones may also be used. Should the soil be of poor quality, good soil should be placed in the trench and around the layers. A good sandy, leafy, peaty soil is best, but care must be exercised to guard against too sandy a soil or when the layers are removed from the parent plant very little of it will remain attached to the roots, resulting in difficult transplanting.

At the time of this removal, the new plants are best severed from the parent with a pair of secateurs, lifted with forks and taken carefully to the nursery, duly labelled, and planted in rows to form good roots before being planted in their permanent places or sent away.

Rhododendron layers need plenty of light for rooting, and should they be in any way crowded, success is bound to be scanty. Many people make the fatal mistake of leaving far too long a layer to root below the elbow. The wood there is much older and takes too long to respond to the wishes of the propagator, and the resultant layer is usually "leggy" and unsightly. A much better plan is to leave not more than a foot (and in many cases less) of growth out of the ground. This, being young, soon roots and eventually breaks well and forms good ideal material.

Dwarf Rhododendrons of the rock garden type may very easily be increased by covering their outer or lower branches with sufficient soil to keep them stationary, while leaving a portion of the leading growth above soil. These readily respond, and, in some cases, ample roots have been formed within a year to enable the successful transplanting of the young plants to new quarters.

ADDITIONAL NOTES ON ALBINO FLOWERS.

By ELEONORA ARMITAGE.

In May 1945 there appeared in the R.H.S. JOURNAL a note on Albino Flowers. In this, I find I omitted *Origanum vulgare*, in which albinism is frequent. Also it may be better to delete *Verbascum Lychnitis* as, though it sometimes has yellow flowers, the opinion of botanists is that it is normally white.

To add to the cream colour instead of yellow in some of the composites, there is *Tragopogon pratensis*. I was able to see this on a morning ramble, as "Jack" does not "go to bed" at D.S.T. noon! I have also found cream-coloured Hawkbit (*Leontodon autumnalis*) and *Crepis virens*. *Lapsana communis* also shows these pale flowers, and more interesting still, in late August in a hedgerow where there were quantities of fruiting plants of this species with their pale brown involucre and seed-vessels on dark wiry brownish-green stalks, there was, in one place, a large patch with conspicuously pale silvery straw-coloured seed-vessels with their involucre, growing on light green stems. This was evidently a colony from one original sport, which one could not overlook.

The first time I have noticed colour variation in grasses is in the common Cocksfoot (*Dactylis glomerata*), in which the usual colouring is a darkish green, purple-shaded stem, glumes and paleae purplish-brown, anthers pinkish-purple, the whole spike having a dark appearance. But occasionally along roadsides (not in cultivation) I have found plants with a light green stem, with flower-heads bearing pale green glumes and paleae, and light straw-coloured anthers; such plants stand out among the ordinary form as conspicuously light in colour, purple being absent.

THE AWARD OF GARDEN MERIT.—LXXVI.

324. COREOPSIS VERTICILLATA.

Award of Garden Merit, Sept. 10, 1945.

There are both annual and perennial species of *Coreopsis*; *C. verticillata (tenuifolia)* is one of the perennials, growing from 2 to 3 feet high with feathery foliage and golden blossoms in July and August. The erect stems are sparingly branched and the sessile leaves, in whorls, are ternately divided, the segments being filiform. The flower heads are about 2 inches across, the ray florets deep golden yellow and the disc a lighter yellow. No special soil is required but the plant is less robust than some of the larger-growing kinds and should be given a good place towards the front of the herbaceous border.

325. GYPSOPHILA PANICULATA 'ROSY VEIL.'

Award of Garden Merit, Sept. 10, 1945.

This variety of the well-known *Gypsophila* is a lower growing plant than the type and makes a compact bush of silvery grey foliage from 1½ to 2 feet high. The tiny flowers are double, white at first, later rosy pink, so that the whole plant has a misty pink effect. It is not particular as to soil and does well in the herbaceous border; it is also excellent as a cut flower. When first introduced it was called 'Rosenschleier,' and is presumably of Continental origin.

FURTHER NOTE ON *EMBOTHRIUM COCCINEUM*.

My friend, Capt. COLLINGWOOD INGRAM, writes me that I am giving a wrong impression in my note last month on this shrub in indicating that it does not grow in the neighbourhood of Llanquihue Lake, as he states that he himself found it on the East side of the Lake growing in some numbers. In justification, I may explain that I only said that I had not seen it there, but I was on a business trip and had very little time to look around. It appears that Capt. COLLINGWOOD INGRAM went a bit further into the country, in the same direction, than I did and there he found it and collected seed. It is interesting to note that these seeds produced plants which were not hardy, and he states that he lost 90 per cent. through frost. The latitude of this region is in the neighbourhood of 42 South. It is, I think, important that future visitors should know that this plant does grow freely in this neighbourhood. Capt. COLLINGWOOD INGRAM agrees that the plants grown from seeds collected in the neighbourhood of Magallanes are quite hardy and that is the important thing for English gardeners and nurserymen.

WILFRID FOX.

COTYLEDON OPPOSITIFOLIA.

THERE is a small but attractive plant grown in gardens under the name *Cotyledon oppositifolia* or *C. simplicifolia*; it is listed in most catalogues of alpine plants. The leaves are glossy and arise from a creeping stem; the tiny golden flowers are held close-packed in branched hanging racemes which have earned it the common name of Golden Shower. It is quite happy in a shady place or grows in the sun if the soil is not too dry, and it is easily propagated.

To anyone familiar with the genus *Cotyledon*, which is chiefly found in S. Africa, this small hardy plant seems very distinct. The S. African *Cotyledons* are of two types: either plants with succulent persistent leaves, often beautifully coloured owing to the thick coating of wax which protects them in the hot dry regions they inhabit, or a type even more adapted to desert conditions in which the stem is much swollen and the succulent leaves appear only for a few months in the year. In both these types the flowers are large, in some species as much as 2 inches long; they are pendent bells, straight-sided with the tips of the petals recurved; the colour is usually some shade of orange red, and the inflorescence is branched but not many-flowered.

Even if the name *Cotyledon* is taken to embrace such genera as *Echeveria* and *Dudleya*, plants of American origin which are now regarded as generically distinct, there is still little to suggest that the *C. oppositifolia* of our gardens belongs to their kindred. If anything it resembles more the Pennywort, found wild in walls and hedges, which is usually known as *Umbilicus pendulinus* but was previously called *Cotyledon Umbilicus*.

C. oppositifolia is a native of the Caucasus and was first collected by NORDMANN some hundred years ago. Later, in 1893, it was again collected by ALBOFF on alpine rocks on Mount Migaria. The date of its introduction to this country is unknown, but it flowered in Miss WILLMOTT's garden at Warley Place in June, 1916, and the plate in

The *Botanical Magazine* t. 8822, was taken from specimens from that plant.

In 1837 LEDEBOUR first described the plant as *Cotyledon oppositifolia*, but a few years later he transferred it to the genus *Umbilicus*, making for the plant a subsection *Chiastophyllum*. But BENTHAM and HOOKER in 1865 merged *Umbilicus* in the genus *Cotyledon* and the plant again became *C. oppositifolia*.

In the latest monograph on the Crassulaceae by ALWIN BERGER (1923) in *Das Pflanzenreich* the subsection of LEDEBOUR has been raised to generic rank and the plant is now known as *Chiastophyllum oppositifolium* by specialist growers who are as interested in the correct naming of the plants they grow as in the plants themselves, but the gardener who merely regards it as a decorative plant will probably continue to call it *Cotyledon*, for this is the name recommended in "Standardized Plant Names" (2nd Ed. 1942) which, though a work of American origin, is likely to be accepted outside that continent, even if some of its rulings are unacceptable in other countries. Crassulaceae is an interesting family which contains a number of plants useful in gardens, mostly of middle rank like the hardy *Sempervivum* and *Sedums*; few of them are "star turns" and the most attractive are the succulent types with glaucous leaves in opalescent colourings; these want cool house treatment in most places though they will survive a fairly low temperature if protected from damp during the resting period. And there are a few which are not quite hardy in the garden, not really happy in a greenhouse and probably best in a frame for the winter, plants like *Umbilicus spinosus* with its beautifully packed winter rosettes, that loosen out in summer, and *Umbilicus chrysanthum* which some call *Sedum* and some *Rosularia* much as *Cotyledon oppositifolia* has changed to *Chiastophyllum*; the family is a complex one and probably this is not the last word on the subject.

But how did it come by the specific name most commonly used in gardens—*Cotyledon simplicifolia*?

V. H.

AWARDS TO PLANTS AFTER TRIAL AT WISLEY, 1945.

Bearded Iris 'Amigo.' A.M. May 22, 1945, as a variety for garden decoration. Plant vigorous, of rapid increase, with erect foliage, 19 inches high. Flower stems erect, straight, five- or six-flowered. Flowers large, stiff, compact and well proportioned. Standards cupped, $2\frac{1}{2} \times 1\frac{1}{2}$ inches, Dauphin's Violet (H.C.C. 039/3), veins of a slightly deeper shade. Falls drooping, $1\frac{9}{10} \times 1\frac{7}{10}$ inch, velvety, oval, Aconite Violet (H.C.C. 937/1) edged with Dauphin's Violet (H.C.C. 039/3). Beard bright golden-yellow. Raised by Mr. E. B. Williamson, Longfield Iris Farm, Bluffton, Indiana, U.S.A., and introduced in 1934. Sent by G. L. Pilkington, Esq., Lower Lee, Woolton, nr. Liverpool.

Rhododendron 'Hinomayo.' F.C.C. April 16, 1945, as an ever-green variety of the Kurume section. Plant of compact, dwarf habit with medium green lanceolate foliage, $\frac{3}{4}$ to 1 inch long. Flowers

wide, open funnel-shaped, $1\frac{1}{4}$ – $1\frac{1}{2}$ inch diameter, with five regular petals; one or two flowers in a truss, a uniform shade of Phlox Pink (H.C.C. 625/1), upper petals speckled at the throat a shade of Phlox Pink (H.C.C. 625). A form of *R. obtusum* from Japan. Sent by the Knap Hill Nursery Co., Ltd., Woking, Surrey.

Rhododendron 'Netty Koster.' A.M. May 28, 1945, as a garden hybrid, Mrs. L. A. Dunnett \times unnamed hybrid of *R. Griersonianum* F. 286. A free-flowering evergreen plant of spreading habit. Foliage lanceolate, $3\frac{1}{2}$ – $4\frac{1}{2}$ inches long, medium dark green on upper surface, paler beneath. Flowers in large round, rather loose trusses averaging 10 flowers, open funnel-shaped, $2\frac{1}{2}$ –3 inches across, a shade of Crimson (H.C.C. 22/1) with slightly darker spots on the upper petal. Raised, introduced and sent by Messrs. M. Koster and Sons, Boskoop, Holland.

Rhododendron 'Orange Beauty.' A.M. April 16, 1945, as an evergreen variety of the Kurume section. Of very free-flowering habit, the result of crossing *R. Hinodegiri* and *R. Kaempferi*. Foliage oblanceolate $\frac{3}{4}$ to $1\frac{1}{2}$ inch long, dark green above, tinged brown beneath. Flowers funnel-shaped $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, three or four in a truss, a shade of Scarlet (intermediate between H.C.C. 19/1 and 19/2) with spots of a deeper tone at throat on upper petal. Sent by the Knap Hill Nursery Co., Ltd., Woking, Surrey.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1945.

Chrysanthemum 'Arnhem.' A.M. September 11, 1945, as an early-flowering variety. Flower stems 20 inches long. Flowers double, 6 inches diameter, rich orange-bronze. Raised and shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. lvii.

Chrysanthemum 'August Glory.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 16 inches long. Flowers double, $5\frac{1}{2}$ inches across, incurved, florets broad of a pale bronzy-crimson shade, with an old gold reverse. Raised and shown by Messrs. Johnsons (Florists), Ltd., Burton-on-Trent. See p. lvii.

Chrysanthemum 'Day Dream.' A.M. September 27, 1945, as an early-flowering variety for exhibition. Flower stems 19 inches long clothed with dark green foliage. Flowers double, $5\frac{1}{2}$ inches diameter, of good form, pale cream-pink; florets somewhat rolled. Raised and shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire. See p. lix.

Chrysanthemum 'Diane.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 20 inches long. Flowers double, somewhat incurved, 6 inches diameter, pale mauve-pink, centre florets of a paler shade. Raised and shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. lvii.

Chrysanthemum 'Fire Drake.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 15 inches long. Flowers double, 4 inches diameter, rich coral-orange. Raised and shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. lvii.

Chrysanthemum 'Freda Pearce.' A.M. September 27, 1945, as an early-flowering variety for exhibition. Flower stems 20 inches long, foliage small. Flowers double, $5\frac{1}{2}$ inches diameter, pale rose-pink,

centre soft apricot-yellow ; florets broad, flat, inner incurved. Raised and shown by Mr. H. Shoesmith, Mayford, Woking. See p. lix.

Chrysanthemum 'Hyde.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 22 inches long. Flowers double, 5 inches diameter, pale rose-pink. Shown by Mr. A. B. Hyde, Eastmoor School, Adel, Leeds. See p. lvii.

Chrysanthemum 'Joan Fellowes.' A.M. September 27, 1945, as an early-flowering variety for exhibition. Flower stems 22 inches long, with rather large foliage. Flowers double, 6 inches diameter, pale rosy-purple, reverse of florets dull creamy-bronze ; inner florets incurved, broad and flat. Raised and shown by Mr. H. Woolman, Shirley, Birmingham. See p. lix.

Chrysanthemum 'Millersdale.' A.M. September 27, 1945, as an early-flowering variety for exhibition. Flower stems 21 inches long, foliage of medium size. Flowers double, 6 inches diameter, white tinged cream at centre, petals somewhat rolled. Raised and shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire. See p. lix.

Chrysanthemum 'Radar.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 20 inches long. Flowers double, 5 inches diameter, of a rich golden-orange shade. Raised and shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire. See p. lvii.

Chrysanthemum 'Sparkler.' A.M. September 27, 1945, as an early-flowering variety for exhibition. Flower stems 24 inches long. Flowers double, 4 inches diameter, rich scarlet-crimson, reverse of florets bronzy old gold ; inner florets erect, outer drooping. Raised and shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire. See p. lix.

Chrysanthemum 'Treasure.' A.M. September 11, 1945, as an early-flowering variety for exhibition. Flower stems 16 inches long. Flowers double, 6 inches diameter, rich golden-yellow. Shown by Messrs. J. & E. Maher, Carisbrooke, South Road, Hampton, Middlesex. See p. lvii.

Coprosma parviflora. A.M. September 11, 1945. A charming New Zealand plant with widespread branches bearing small obovate leaves and studded with tiny translucent, pearl-like berries. This plant was described under the name *C. rigida* in R.H.S. JOURNAL, 69, p. 291. Shown by Major E. de Rothschild, Exbury, Southampton. See p. lvii.

Dahlia 'Betty Holmes.' A.M. September 11, 1945, as a variety for exhibition. A large scarlet Cactus variety of excellent form with long curled florets tipped with silver. Raised and shown by Messrs. J. Stredwick & Son, St. Leonards-on-Sea. See p. lviii.

Dahlia 'Charlotte Collins.' A.M. September 11, 1945, as a variety for exhibition. A large, rich orange-scarlet Decorative variety of Australian origin with broad florets. Exhibited by Mr. Stuart Ogg, Swanley. See p. lviii.

Dahlia 'Herbert Brown.' A.M. September 25, 1945, as a variety for exhibition. A very full, large informal Decorative variety. Flowers 8 inches diameter, Tyrian-rose tipped with gold ; florets broad, yellow at base. See p. lix.

Dahlia 'Marion Tate.' A.M. September 11, 1945, as a variety for exhibition. A large Decorative variety with broad florets yellow at the base, and having a cream ground flushed with mauve pink. Raised and shown by Messrs. J. Stredwick & Son, St. Leonards-on-Sea. See p. lviii.

Doritis pulcherrima var. 'Verulam.' A.M. September 11, 1945. This variable species is a native of Cochin China and has been cultivated in gardens since 1874, although sometimes under the name *Phalaenopsis Esmeralda*. The present example bore a spike of seven rose-lilac flowers, and was exhibited by Messrs. Sanders, St. Albans. See p. lvii.

Gentiana 'Orva.' A.M. September 11, 1945. This plant is a cross between *Gentiana ornata* and *G. Veitchiorum*, the former being the seed parent; it is intermediate in character and easier to grow than either of the parents. It forms a compact plant with flowering stems about 3 inches high; the flower is $\frac{3}{4}$ to 1 inch across, trumpet-shaped and the colour of the lobes is Cobalt Blue (H.C.C. 44/1); the tube is paler, lined with green. Shown by G. H. Berry, Esq., The Highlands, Ridgeway, Enfield. See p. lviii.

BOOK NOTES.

"Further Work on Plant Injection for Diagnostic and Curative Purposes." By W. A. Roach and W. O. Roberts. 4to. 12 pp. Illus. Technical Communication No. 16, Imperial Bureau of Horticulture and Plantation Crops. (Obtainable from the Bureau, East Malling, Kent, 1945.) 1s. 6d.

This communication describes improvements made in plant injection methods since they were described in detail in 1938 and 1939 by W. A. Roach (Tech. Com. No. 10), and includes experience on a wider range of plants, both in this country and in South Africa.

"Plants and Plant Science in Latin America." Edited by Frans Verdoorn. Large 8vo. 381 pp. Illus. (Chronica Botanica Co., Waltham, Mass., U.S.A.; Wm. Dawson & Sons Ltd., London, W. 1, 1945.) \$6.00.

This book consists of a large number of articles by many contributors covering the range of plant interests in Latin America. Some of the articles have already appeared in *Chronica Botanica*, but the majority are here published for the first time. The work is intended to give the agronomist, botanist, forester and phytopathologist information concerning the wild and cultivated plants of Central and South America. It is illustrated by plates from classical publications and by a number of maps; chapters of special importance are: Historical Sketch, by F. W. Pennell; Problems of Tropical Agriculture, by Wilson Popenoe; Phyto-geographic Sketch by A. C. Smith, and I. M. Johnston, and Economic Plants by F. R. Fosberg. There is also a very useful list of the Plant Science Institutions, Museums, Gardens, Societies and so forth in Latin America. Anyone taking up work on the flora of South America in any of its aspects, would find this book extremely useful.

"Soil Sense for Green Gardeners." By George E. Whitehead. Sm. 8vo. 98 pp. (Adam and Charles Black, Soho Square, London, W. 1, 1945.) 3s.

This little book gives in simple language the operations needed to maintain the soil in a fertile condition, and the reasons for them.

"Cauliflowers." Ministry of Agriculture Bulletin No. 131. 8vo. 16 pp. Illus. (H.M. Stationery Office, 1945.) 9d.

This *Bulletin* gives full details for the cultivation of Winter (or Broccoli) and Summer Cauliflowers, with a list of the varieties with the dates of sowing, time of reaching maturity, etc., and also methods of harvesting, packing and marketing.

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